DOCUMENT RESUME

ED 254 205 IR 011 517

AUTHOR	Griffin, Gary A.; Wilson, Elizabeth C.
TITLE	Guidelines for the Design, Production, Development, and Use of a Telecommunications Program in Schools.
INSTITUTION	Designs for Education, Concord, MA.
SPONS AGENCY	Corporation for Public Broadcasting, Washington, D.C.
REPORT NO	ISBN-0-89776-096-4
PUB DATE	Dec 83
CONTRACT	1705-70113
NOTE	97p.; For the related report, Telecommunications and the Schools, see ED 245 668.
AVAILABLE FROM	Corporation for Public Broadcasting, 1111 Sixteenth Street, NW, Washington, DC 20036.
PUB TYPE	Guides - Non-Classroom Use (055) -- Information Analyses (070)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*Change Strategies; Curriculum; *Decision Making; Elementary Secondary Education; Guidelines; *Models; *Policy Formation; Program Development; Program Implementation; *Staff Development; Technology Transfer; *Telecommunications
IDENTIFIERS	Goodlad (John I)

ABSTRACT

This document, the second of two based on a study of telecommunications in the schools conducted by Designs for Education, uses data from the first volume as a basis for discussion and recommendations concerning the integration of telecommunications into elementary and secondary education. Intended for use by the professional in education and telecommunications, this book is a comprehensive text about effecting change in school practices. A description of the study framework emphasizes levels of decision making identified by John I. Goodlad (1966) and the curricular decisions to be made at those levels. Data sources for decision making are suggested, and findings from the original study are presented in terms of the framework and as a way to illustrate the data sources in use. A staff development strategy is then suggested as a means to accomplish the goals of curricular decision making and implementation. The components of a support system designed to meet the needs of introducing telecommunications into schools are described, and categorized as intellectual; management of the environment; provision, allocation, and use of resources; evaluation; and communication. Guidelines for the development, production, and use of a telecommunications program in schools are then advanced and recommendations are offered for further action. (LMM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED254205

Guidelines for the Design, Production, Development, and Use of a Telecommunications Program in Schools

Prepared by
Gary A. Griffin and Elizabeth C. Wilson
December 1983

This material was developed pursuant to
Contract 1705-70113
between Designs for Education and
Corporation for Public Broadcasting

IR 011 517

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Corporation for Public Broadcasting
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

© Copyright 1984
Corporation for Public Broadcasting
1111 Sixteenth Street N.W.
Washington, D.C. 20036
An Equal Opportunity Employer--M/F
ISBN: 0-89776-096-4

Table of Contents

INTRODUCTION.....1

Organization of the Report.....4

I. THE FRAMEWORK.....4

The Conceptual System of John I. Goodlad.....5

Levels of Decision Making and Practice.....6

The Curriculum Planning Rationale of Ralph W. Tyler.....11

The Role of Data Sources in Curricular and Instructional Decision Making.....17

Reorganization of Findings from Report I, Telecommunications and the Schools.....22

Instructional Level Findings.....23

Institutional Level Findings.....24

Societal Level Findings.....25

Ideological Level Findings.....25

II. TOWARD CHANGE IN TELECOMMUNICATIONS PRACTICE IN SCHOOLS.....25

Features of a Staff Development Model.....26

The Concept and Operation of Support Systems.....39

Support System Component I: The Intellectual.....55

Support System Component II: Management of the Environment.....57

Support System Component III: Provision, Allocation, and Use of Resources.....59

Support System Component IV: Evaluation.....60

Support System Component V: Communication.....61

III. GUIDELINES FOR THE DESIGN, PRODUCTION, DEVELOPMENT, AND USE OF A TELECOMMUNICATIONS PROGRAM IN SCHOOLS.....65

Design.....68

Development.....71
Production.....74
Dissemination.....76
Evaluation.....79
Adoption.....82
Revision-Modification.....83
Building Linkage between Telecommunications and the Schools.....85
REFERENCES.....88

List of Figures

Figure 1. A framework for curricular and instructional decision making.....15

Figure 2. Illustration of the use of the framework for curricular and instructional decision making.....16

Figure 3. Elements of a support system for introducing telecommunications programs into schools.....54

Figure 4. Stages of the process and institutional responsibilities for developing and implementing telecommunications programs...67

GUIDELINES FOR THE DESIGN, PRODUCTION, DEVELOPMENT, AND USE OF A TELECOMMUNICATIONS PROGRAM IN SCHOOLS

INTRODUCTION

This is the second of two reports that grew out of a study of telecommunications and the schools commissioned and supported by the Corporation for Public Broadcasting (CPB). The study was conducted by Designs for Education (DFE), an educational service organization in Concord, Massachusetts. The first report, Telecommunications and the Schools (1983), presented a description of the methods used in the study and had as its principal substantive focus the findings of the study. The findings were listed and discussed, and then analyses of the findings were presented in nontechnical language. That document was intended for school and telecommunications persons and for such members of the general public as might be interested. The information presented in that first report comprises the data base upon which this second one is built. That is, the findings reported in that document led the DFE team to consider the need for the discussions and recommendations in this one.

This report is addressed to those persons who are involved in the complex and often ill-understood world of policy and practice decision making as well as to those persons who are charged with the tasks of carrying out the decisions related to using telecommunications as educative instruments. For example, the telecommunications experts formulated programs of instruction which were then left at the schoolhouse door in the belief that the school officers had the skill and energy to implement the programs. Implicit in this practice is the belief that the problems and issues associated with planning and producing and those with implementing are separate but that they can be mutually supportive. Unfortunately, this seems not to be the case. Leaving the job of implementation solely to school people has not worked. And,

leaving the job of planning solely to telecommunications experts may have diminished the potential of instructional programs for causing student change. Innovation in any field of endeavor is a difficult process. In the complex world of schools, change must be approached with understanding of what is to be changed and what will most positively cause the change to happen. This paper considers how policy and decision making can take into account the several requirements of program planning and implementation such that important instructional ends can be accomplished.

We are concerned here with the need for a concerted and systematic clarification of the role of telecommunications in school-based instructional programs. Through the exercise of clarification, we can propose a model for decision making and the systematic use of explicit guidelines to provide logical insurance that the educational change will be taken seriously by telecommunications and school experts alike.

This report is more technical in nature than the first one and requires more background and knowledge of professional educational ideas and concepts. It is intended to serve as a guide to successfully moving through the maze of interlocking and related agencies, influences, and pressures that exist within the fields of educational institutions and educational telecommunications.

The primary objective of this report is to advance a set of logically related guidelines for producing, implementing, and using telecommunications in schools. These guidelines take the forms of curriculum decision making suggestions and staff development and support system strategies for working with individuals and groups such that the decisions are implemented and, subsequently, make positive differences in the lives of students, teachers, and others in educational settings.

The study out of which this report grew used a variety of data sources to inform the study team about (1) the problems and prospects of telecommunications, (2) schools as places where telecommunications might be used as educational technologies, (3) the primary curriculum emphases of schools (present and future), and (4) the roles people play as telecommunications enterprises and school organizations that either "work" or do not. These data sources, expert opinion and research as well as literature review, comprised the wellspring from which a large amount of information was generated. The information, some positive and some not so, was used to build a case for better understanding, on the one hand, the promises of telecommunications as an educational technology and, on the other, the problems of the past several decades in accomplishing those promises.

The DFE study team ended the first report with the conclusion that, in regard to telecommunications and the schools, ". . . leadership is a many splendored thing. Yet it is an ingredient which has not been fully developed either by school systems or by educational telecommunications agencies. The times cry for educational statesmen of the first order. Their task will be to help to promote both unity and diversity. It is a formidable undertaking, but one which could be extraordinarily challenging." (Designs for Education, 1983, pp. 68-69)

This second report is intended to serve as a guide to the development and maintenance of that leadership function at several levels in the educational and telecommunications worlds of policy and practice. Certain of the suggestions in this proposed decision making scheme have been tested by research, others are rooted in commonsense and logic, and others are proposals based upon expert clinical judgments. Taken together, the proposals for action may form a conceptualization from which a more coherent system of

dealing with telecommunications as a vital component of school programs can be tested.

Organization of the Report

The report is organized so that the reader will understand the framework that guided the data collection and some of the analyses reported elsewhere. Consequently, the first section describes this framework in some detail with particular attention paid to levels of decision making and the curricular decisions to be made at those levels. Data sources for decision making are suggested and the findings from the original DFE study are presented in terms of the framework and as a way to illustrate the data sources in use. A staff development strategy is then suggested as a means to accomplish the goals of curricular decision making and implementation. The dimensions of a support system designed to meet the needs of introducing telecommunications into schools are described. Guidelines from the development, production, and use of a telecommunications program in schools are advanced, based on the material that precedes their introduction. Finally, there are suggestions related to the "Where to go from here" question.

I. THE FRAMEWORK

It is a truism that schools are complex organizations that often function more with the intent of "taking care of business" in an expedient fashion than of formulating and acting upon reasoned decisions about how best to accomplish important societal and cultural missions. The reasons for this are many and varied. They include the need to do the business of schooling in the face of continually changing student populations, the increasing bureaucratization (some might say Balkanization) of the school as a coherent human organization, the perceived inadequacy of school persons, the lack of community and

governmental support for matters educational, and so on. Whatever the reasons, perceptive observers of school practices are, and have been, concerned about the apparent non-rationality of keeping school.

This conclusion, however, is helpful when one begins to attempt an understanding of why schools seem to be resistant to change, hesitant if not recalcitrant regarding innovative practices, and spasmodic in the adoption and retention of anything "new." Sarason's (1971) observation that "the more things change the more they remain the same" is, we fear, more accurate than not. In the case of telecommunications, instructional television (ITV) is a good example. After an initial flurry of high interest and subsequent federal and private foundation funding for testing out ITV's instructional possibilities, it became clear that ITV amounted to a few cases of outstanding practices widely scattered across the fifty states. There is a great deal of informal testimony to the problems associated with introducing and maintaining ITV as a central component of instruction.

The issues surrounding adoption and use of instructional innovations, then, are not well understood and a means to act upon this lack of understanding has not been precisely conceptualized. The lack of understanding leads many to be hesitant about introducing yet other telecommunications innovation into schools.

The Conceptual System of John I. Goodlad

As a means to make some sense out of what the DFE team perceived as highly problemmatic situations in regard to telecommunications and schools, a guiding conception of decision making was adopted as a "sorting device." This guide, The Development Of A Conceptual System for Dealing with Problems of Curriculum and Instruction, was proposed by Goodlad and Richter (1966) and has been subjected to research, theoretical, and practical scrutiny by scholars

and practitioners since then (Goodlad & Associates, 1979). The framework is a way of looking at educational (principally schooling) decision making so that the coherence (or lack thereof) of an educational system, broadly conceived, is revealed.

Goodlad originally noted that the framework was descriptive of practice. This claim was partly upheld (Griffin, 1979). Persons who have used the framework have found it to be helpful as a descriptive tool but even more powerful as a prescriptive one. That is, the framework is appealing as a way to guide practice, a way to help people conceive of their roles and responsibilities within a larger perspective than individual classrooms, schools, or even systems allow. It is this opportunity to use the framework to examine interacting arenas of decision and practice that convinced the DFE team of its potential for guiding the study of telecommunications and the schools and for advancing a coherent system for integrating findings and recommendations from that study.

It must be acknowledged that this discussion is necessarily truncated. The reader who wants the full detail of the Goodlad proposal is urged to refer to the original document.

Levels of Decision Making and Practice

Goodlad's framework is guided by the belief that there is (or should be) a rational means to look at the interacting and intersecting realms of educational decision making and practice such that relationships are (or could be) described and acted upon. Following sociological schemes of thought, principally those of Parsons (in Merton, Broom, & Cottrell, Jr., 1959), Goodlad sorted the educational enterprise into four so-called levels; ideological, societal, institutional, and instructional. The levels differ in their temporal and intellectual distance from students in classrooms and in

their specificity of decision making. The ideological level is most removed from students and classrooms and is most general in decision making. The instructional level is closest to students and is most specific. Each of the four levels will be discussed in turn.

The ideological level of Goodlad's system refers to those influences on educational issues that emerge as a consequence of being sent forth as messages from "experts" or opinion leaders. (This definition has evolved and changed somewhat from Goodlad's original statement. In that document the differentiation was not as clearly drawn as is necessary for our purposes in that the role of groups of experts, such as a "blue ribbon panel" on school issues, was not explicitly ideological in nature. We contend that such bodies of experts, real or designated, operate largely outside the structure of the schooling enterprise but can have a great deal of impact upon it through their pronouncements about problems and solutions.) It is only the politically naive person who discounts the influence that a non-educator such as Hyman Rickover, for example, can have on educational practice. The ideological level accounts for these influences, and the educational decision maker, behaving rationally and thoughtfully, tries to follow and understand the currents of opinion and fact that are located, in many instances, outside educational settings. Currently, at the ideological level there is the apparent widespread belief, at least in terms of public opinion polls and popular media, that computers, mini and micro, can and will revolutionize the nation's elementary, secondary, and tertiary schools. Notwithstanding the strong possibility that commercial interests are central to this push for computers in schools, acknowledging the presence of this current emphasis is to pay attention to the ideological level of the system proposed by Goodlad. In like fashion, one could note at the ideological level such issues as merit

pay for teachers, public opinion regarding declining SAT scores, the growing tendency to consider teachers as ill-prepared for their roles, the sentiment that schools should return to the "basics," and so on. Historical examples of the impact of the ideological level on educational practice include the pronouncements that "Johnny can't read," the proposals for ethnic studies as educational solutions to political problems, the indictments of the so-called "secular humanism" in schools, and so on. Educators and others know about these issues, of course. It is the concerted attempt to consider them in terms of how they impact on the ways that educative organizations go about their business that is considered critical by Goodlad and others concerned with improving or somehow changing schools.

Ideological level persons are usually considered to be experts whose observations and opinions count. They can also be considered as associations or agencies in the instance of public opinion noted above as well as groups of people affiliated by common subject matter, political, or intellectual focus (e.g., American Educational Research Association, Council on Basic Education, The Heritage Foundation, National Council of Teachers of English, National Association of Elementary School Principals, etc.).

The second level of the conceptual framework is the <u>societal</u>. This level can be located conventionally by thinking of federal, state, and local bureaucracies. In each political organization of the country there are societal decision making bodies. At the federal level, societal decisions are formulated and put into practice as both policy and rules and regulations. Examples of federal societal decisions are Public Law 94-142 (the mainstreaming of handicapped persons into regular classrooms), bilingual education legislation, compliance with equal opportunity requirements, and the like. In state organizations, the societal level influence is expressed in

such issues as hours required for each subject in elementary schools, graduation requirements (e.g., Carnegie Units) for secondary schools, formulas for determining state financial allocations to local districts, procedures for enforcing federal rules and regulations, and others. In local communities, societal level decisions are often concerned primarily with funding decisions and formulation of broad goals or missions for schools. In a rational system, there would be a positive and direct relationship among the societal decisions made and put into practice at federal, state, and local levels of the educational enterprise. This rationality would be demonstrated, for example, if the federal government required that schools provide bilingual education for students whose primary language was not English, the state developed plans to implement this requirement in the forms of technical or human assistance, and a local board of education charged the school district officers with developing, monitoring, and evaluating a program of bilingual instruction in the individual schools.

Societal level persons can be influential members of federal, state, and local bureaucracies (e.g., Secretary of Education, director of bilingual education for a state, superintendent of schools) or members of sanctioning bodies (e.g., a local board of education member).

In terms of assisting in school improvement and district renewal, the importance of the societal level of decision making for both policy and practice should not be underestimated. The curriculum reform movement of the 1960's and early 1970's illustrated both sides of the coin. In districts that provided both policy and material support for new curricula (e.g., the "new mathematics"), it was more probable that teachers and students were observed using the new materials and engaging in the unaccustomed arithmetic operations. Conversely, where districts mandated use but provided little

support for it, observations were of "business as usual." The societal level of decision and action, then, is an important pressure point for the introduction and establishment of educational innovations.

The institutional level of the Goodlad schema denotes the people and processes that are to be found between the societal level of policy formulation and resource allocation and the interactions among students and teachers in individual classrooms. This institutional level can be thought of as the intermediary or facilitating mechanism that goes about the important activities of seeing that policy is translated into teaching and learning practices. For example, a societal body at the local level such as a board of education formulates a policy regarding homework (not an unusual case in present times) and teachers are expected to carry out this policy. The institutional level, if functioning logically and rationally, will engage in such activities as providing precise information about the policy to teachers, making assistance available in record keeping and other administrative details, providing inservice opportunities to teachers that focus on what are the best ways of working with parents of noncomplying students, and so on. The institutional level, then, might be seen as the translator and facilitator of policy (with the full understanding that policy is also often made by institutional level persons).

Institutional level persons include those charged with leadership in school district central offices (e.g., director of elementary education, supervisor of reading, etc.) and in individual schools (e.g., principal, department chairperson, etc.). In addition, the institutional level persons can include groups, such as all of the teachers and administrators in a single school working together toward commonly agreed-upon purposes. Although this last example is not widely observed in practice, it has been demonstrated that

this mode of institutional decision making is a characteristic of effective schools.

The instructional is that level of the conceptual system which is often focused upon exclusively, the individual classroom. This level is where the consequences of providing schooling to members of the society are expected to be seen. That is, teaching goes on and, one hopes, learning occurs. The instructional level, because of its obvious place in the school bureaucracy as well as its public nature (most parents are at least minimally aware of what happens in their child's classroom), is where most school criticism is aimed. This criticism may be of teaching practice, of learning outcomes, or of curriculum requirements and materials. This is where teachers interact with students. This is where telecommunications is in place or is not. This is where the textbooks, whether praised or condemned, are used. And this is where the public has most immediate access to the system of schooling.

Instructional level persons are teachers and students as well as, in some rare cases, teams of teachers who work together with identifiable groups of students (as opposed to teachers who work separately with the same students as in departmentalized elementary and secondary schools).

The Curriculum Planning Rationale of Ralph W. Tyler

Before discussing the relationships between and among the levels of decision making and activity, another element of the framework used to guide the DFE study will be introduced.

Although there has been a fair amount of criticism of Ralph Tyler's (1949) rationale for curriculum planning (Kliebard, 1970), it must be acknowledged that Tyler's scheme for determining the decisions necessary to the formulation of a well-articulated program of study is, and has been, well received by both scholars and practitioners. Tyler's rationale helps to sort

out the many components of a curriculum in a manner that allows for understanding the relationships among the parts that form the whole.

The term curriculum is used widely and appears to have a variety of definitions, usually dependent upon the user's purposes. Because this report considers curriculum issues extensively, it is necessary to set forth the meaning of the term in this context. By curriculum, we mean a set of intentions, a carefully formulated plan to guide instruction. In other words, a curriculum is a carefully thought out set of activities that can be used by educators to assist in dealing with the complexities of classroom life. Instruction, on the other hand, is the actual acting out of the curriculum, the activities and interactions engaged in by students and teachers in educational environments. These definitions are somewhat arbitrary and, of course, the separation of curriculum and instruction can be argued as being an impossible task. We make this distinction in order to clarify the important distinction between having a set of intentions (a curriculum) for student and teacher behavior (instruction) and acting only on impulse or in other unpredictable ways. Naturally, we take the position that planned classroom activity is, in most instances, better than unplanned.

Briefly, Tyler's plan suggests that the curriculum planner take into account the objectives to be accomplished by the curriculum, the learning opportunities to be provided for students that are most promising of accomplishing the objectives, the organization (or sequencing) of the learning opportunities that is most logically powerful in meeting the objectives, and the evaluation procedures that will be used to determine the degree to which the objectives are met. A major contribution made by Tyler was his proposal that any purpose for instruction have two elements, behavior and content. That is, the objective should specify how a learner or group of learners will

act (behavior) in terms of subject matter (content) if instruction is effective. For example, the student will draw a map of China, or compare the cultural life of Boston with that of Richmond in 1810, or play the scale of C minor on the piano. The Tyler plan, which begins with objectives and moves through learning opportunities and organization to evaluation, is highly rational and, some would say, too specifically positivist in nature. It is, however, a plan that appeals to the practical minded school person and to the persons charged with providing numbers of teachers with guidance for instruction.

The DFE team used the Tyler scheme as another way of sorting out the large amount of data gathered during the preliminary phase of the project. It helped in the planning and organization of information regarding the goals of schooling, the activities provided to students, the organization of those activities, and the ways in which evaluation of instructional programs and students takes place.

When one considers the Goodlad conceptual system in relation to the Tyler rationale for curriculum planning, one can capture much of the policy and practical educational activity deemed necessary and desirable for the planning and implementation of an educational change.

To this point, we have treated the Goodlad framework and the Tyler raticnale as separate entities. We now turn to the potential for better understanding the curriculum enterprise when the two schema are combined.

It will be recalled that the Goodlad framework suggests four levels of decision and action in regard to curriculum issues: ideological, societal, institutional, and instructional. The Tyler rationale advances four components of such decision and action: objectives, learning opportunities, organization of learning opportunities, and evaluation. These levels and

components can be combined so that the Goodlad levels become the vertical axis of a grid and the Tyler components the horizontal axis. The result of this combination appears as Figure 1.

If one were to use Figure 1 as a prescriptive guide for curricular and instructional decision making, it becomes apparent that certain decisions logically "fit" certain cells. This conclusion can be illustrated by a set of decisions that are relatively typical of school programs. Figure 2 sets forth these decisions. Naturally, only a small piece of a curriculum is suggested here. In order to cover all of the decisions necessary to guide instruction, a much larger grid would be needed.

Several characteristics of Figure 2 should be noted. First, the ideological level is one of influence rather than action in relation to curriculum decisions. In this example, the influence is in terms of public opinion regarding declining standardized test scores of elementary school students. This influence is reflected in the decision by a board of education (the societal level) to propose a broad purpose regarding emphasizing comprehension skills for all of the elementary schools in the school district. Second, there is compatibility between the societal level decision to emphasize comprehension skills and subsequent decisions at other levels. The policy decision is acted upon by the school district and the individual school (institutional level) by the public acknowledgment of the formulation of a goal for instruction in terms of reading comprehension. This goal, it can be seen, is for all elementary school students and can be interpreted differently according to age and developmental level. Third, the compatibility is further demonstrated by the decisions made at the instructional level by individual teachers. That is, the teachers make decisions regarding reading instruction

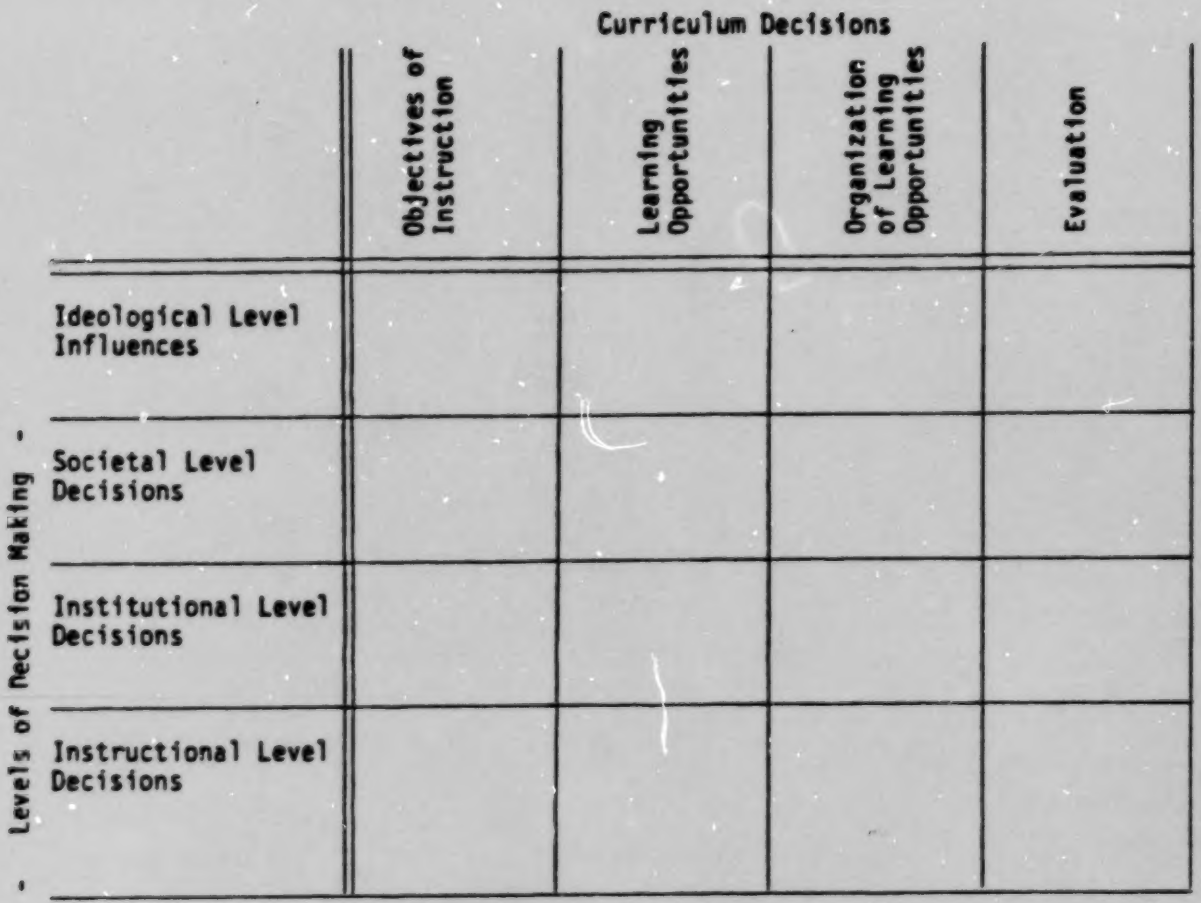


Figure 1. A framework for curricular and instructional decision making

BEST COPY

	Objectives of Instruction	Learning Opportunities	Organization of Learning Opportunities	Evaluation
Ideological Level Influences	Public opinion polls demonstrate major dissatisfaction with reading achievement scores	Dr. _____ asserts that students need a background in oral language	Prof. _____ recommends that students should move from teacher direction to independence	Dr. _____ say that evaluation must be logically and directly relate to objectives
Societal Level Decisions	All teachers in all elementary schools will concentrate on providing instruction in reading comprehension	Teachers will provide prior discussion opportunities tied to text-based events	Schools will allocate at least 60 minutes per day for reading instruction	A district evaluation team will design and field test a means to determine pupil gain in reading comprehension
Institutional Level Decisions	All students will be able to predict, locate, organize, remember, and evaluate information from print	Students will practice expected behaviors using story map techniques	All expectations (e.g., prediction, etc.) are to be attended to according to teacher's diagnosis of appropriate sequence	The evaluation procedure will concentrate on student ability related to predicting, location organization, memory, and evaluation skills
Instructional Level Decisions	The student will make a logical prediction from the title of a story about events in the story	Students will discuss a book before reading, concentrating on clues that can be drawn from the title, story parts, and pictures	Students will first discuss the clues with the teacher, then in pairs, then independently	The teacher informally observe student behavior records judgments, and reteaches or moves to another activity

Figure 2. Illustration of the use of the framework for curricular and instructional decision making

that are in line with both societal level and institutional level expectations regarding the emphasis upon reading comprehension.

An examination of the horizontal axis reveals another set of compatible decisions. The decisions regarding learning opportunities, organization, and evaluation are logically related in that they do not conflict with one another and can be seen to be supportive of the purpose, goal, and objectives decisions.

The desirability of such a framework for making decisions about curriculum and instruction in schools is, we think, obvious. In a very complicated human enterprise like schooling, it is possible to get caught up in the details of the work and forget that what one does is affected by and often affects what others do. With the Goodlad-Tyler conception of curriculum planning and instructional activity, it is possible to stand back and look at a larger picture than is usually available to people concerned with school programs and practices. We know that this larger picture is not always necessary for everyone but we believe that it is highly desirable and potentially powerful for influential decision makers in schools and in other organizations concerned about schools.

The attention to where decisions are made, as noted in Figure 2, ignores to a large degree the sources of information that can be helpful in making the decisions. The next section of this report advances four data sources as decision making resources and presents the findings of the DFE study as illustrations of how the data sources influence our understanding of telecommunications and schools.

The Role of Data Sources in Curricular and Instructional Decision Making

Although there has been consistent attention to the importance of decision making in literature regarding organizations, including schools, the

particular role that guidelines play in the making of decisions has not, we feel, received commensurate attention. In other words, although the notion that decisions are made to guide the work of a group of people is acknowledged as a vital organizational function, the values and information used to decide to take one course of action over another is given relatively short shrift.

Persons charged with making decisions in schools, whether about policy that will affect large numbers of educators and students or about one piece of instructional material that will be given to just one child in one elementary classroom, must bring some information to the decision making activity. This information can be experiential or theoretic, value-laden or relatively factual, idiosyncratic or widely-agreed-to. Whatever its nature, the information brought to bear by a person engaged in making a decision is predictably influential upon the decision and, we think, in many cases influential upon how the decision will be perceived by and acted upon by those who are affected by it.

For example, Mr. Smith who teaches 7th grade social studies, is informed that the school principal has decided that all students should receive instruction in contemporary Asian issues. This institutional level decision, using Goodlad's term, is made as a consequence of the principal's concern that students should know about the resurgence of Asia as a major political and economic force in current world affairs. This decision on the part of the principal may seem, at first glance, to be a good move toward bringing students in touch with important new world developments. Mr. Smith, however, is caught up in the dilemma of how to go about turning such an institutional level decision, in this case unaccompanied by other decisions that would support teachers in their efforts to <u>do</u> contemporary Asian history, into a stimulating and meaningful experience for thirteen-year old boys and girls.

He is resentful of an institutional level decision being made without his involvement in the planning, feels inadequately intellectually prepared himself on this subject, believes the study to be beyond the interests and capabilities of his class, knows of no instructional materials that the students can use to support their study, and worries that the students' coverage of the Civil War period in United States history will be shortchanged by the addition of a study of contemporary Asian economics and politics. However, Mr. Smith is probably relatively certain that the principal had used little information about schooling or teaching when he made the decision.

The point to be made here is that this example, far more representative of school decision making than some would suspect, suggests that the principal was not acting out his important role with a guiding conception of schooling (or leadership) in light of rational and well-conceptualized information about all the factors involved.

What could inform decision making? We propose four data sources for the development of guidelines to influence policy and practical affairs in regard to school curriculum decisions. They are (1) values, (2) funded knowledge, (3) conventional wisdom, and (4) craft knowledge. Each will be discussed briefly.

Values are those beliefs that have intrinsic worth for the holder. Although some values can be verified as being "true," this is not a necessary condition. All humankind have values. They can be idiosyncratic or cross-cultural. Perhaps the most obvious example of the persistent presence of values as contributors to decision making can be found in communities of interest formed around organized religion. Although certain "oughts" or "shoulds" cannot be verified through historical or current evidence, the religious conventions, sometimes based upon faith, promote them as guidelines

for life and, in some cases, for afterlife. Values are important and persistent influencers of decisions in schools. It is not uncommon for educators to preface a decision with "I believe that..." and use the belief as the evidence that a certain course of action should be taken. To ignore or deny the role of values in decision making is to be foolhardy at best and suicidal at worst. So is an inability to distinguish between values and verifiable knowledge.

Funded knowledge is that body of information, usually research-derived and/or theoretical, that has been tested and has withstood the tests over time. The most obvious example of funded knowledge is that body of both process and product "facts" that comprise mathematics. Despite differences in symbols to denote number, the properties of number are consistent across cultures and over time. Although different ways of using number (e.g., the Hebrew versus the Christian calendars) can be observed, the features of the concept of number are constant. In the same ways, most of the physical sciences and some of the emerging social sciences can be characterized by funded knowledge. The key here is predictability and probability -- a piece of funded knowledge is characterized by whether it occurs with marked frequency in similar or same fashion and whether, when it does occur, it is not a surprise to the trained observer.

Conventional wisdom can be thought of as those ideas and beliefs that are widely agreed-to but have received little systematic verification attention and may not be universally applicable. Such statements as "all teachers should be very strict at the beginning of the year and then soften up," "all young children learn best when they move from the concrete to the abstract," and "experience is the best teacher" are examples of conventional wisdom. These statements are probably true in many cases and not true in some. They

have received little rigorous research attention but have a commonsense ring to them. And, importantly, they can be verified through personal experience.

Craft knowledge is what is known about a particular arena of work. For teachers, craft knowledge might include how to go about setting up a system of classroom rules and procedures, the turning off of lights to signal the need for student attention, using a classroom monitor system to increase student responsibility, using folders for student work so that both teachers and students can keep track of what has been accomplished and what still has to be done, how to set up a role playing activity, and so forth. Usually, craft knowledge is concerned with activity, with doing, with practice. And, craft knowledge appears to many observers to be the dominant contributor to criteria about what schools and classrooms should be like.

In sum, values, funded knowledge, conventional wisdom, and craft knowledge are sources of guidelines for making decisions. Certainly, it would be desirable to the rationally inclined person for decisions to be rooted solely or mainly in funded knowledge. But, life is not certain and the conventions of living are necessarily problemmatic. To ignore deciding because of the absence of a body of funded knowledge is, we think, a prediction of immobility. We use funded knowledge when it is available, we test the strength and durability of our values when appropriate, we turn to conventional wisdom when necessary and desirable, and we trust our craft knowledge when we are relatively certain it works for us. This blend of information helps us to make sense out of our world, whether that world is defined as all that we can comprehend or only as what is happening today with this child in this classroom.

The important point for decision makers is to recognize the source of information and to acknowledge the strengths and weaknesses of the information

in terms of making decisions. We are concerned with the conscious attending to why we do what we do and why we propose that others do as we wish them to do. We believe that the issues, problems, and prospects surrounding the planning and implementation of telecommunications in schools will be clarified and promoted positively, in part, through the deliberate attempt to understand how decision making is shaped by the data sources that are consulted and, in turn, how people, processes, and products are influenced by the guidelines used in making the decisions.

Reorganization of Findings from Report I, Telecommunications and the Schools

It will be recalled that Volume I of the DFE study presented sets of findings related to school and society, the school as an institution, curriculum, learning and telecommunications, teachers and teaching, and resources and inter-institutional relationships. These findings are clearly influenced by the four data sources discussed above. One way of organizing the findings, other than by logical topic areas, is to sort them into the appropriate levels of the framework presented earlier. That is, findings that relate particularly to classrooms would be called instructional findings, ones that refer to schools or school systems would be institutional, ones that refer to policy decisions would be societal, and ones that fall outside the purview of the schooling enterprise but are influential upon it would be ideological findings. Examining the findings sharply illustrates that some decisions fall into more than one level, promoting the understanding that the levels of decision and action are interactive and that decision makers at one level are often required to work in concert with decision makers at other levels to bring about change. The reorganization of the DFE Volume I findings is presented below. A finding that is placed at more than one level is indicated by an asterisk (*).

Instructional Level Findings

Schools have been given (and have taken) a great many new tasks during the past generation *

Schools are complex human and social organizations *

All school persons need continuing education *

There is a lack of congruence between levels of decision making in the school system *

Telecommunications can be powerful and effective tools for teaching and learning

Research on learning and personality theory, and on human growth and development has been increasing, but remains slow to reach the practitioner and the public *

Despite a lack of one-to-one correspondence between research findings and classroom practice, there are important teaching-learning implications to be found in learning and personality theory, studies of human growth and development, media theory and in new insights into the functioning of the brain. For example, it would be well to introduce new learning and skills at times in the development of children and youth which coincide with spurts of brain growth.

Telecommunications has unique teaching-learning capabilities, such as the power to motivate and the power to illustrate abstract ideas through series of concrete examples when these are featured by producers and by teachers as they plan the use of television with children and youth

Recent research has documented that teachers can make a difference in student learning and achievement

There is an apparent antipathy toward technology by teachers

Teachers are more likely to use technology over which they believe they have control and to which they have easy access

Teachers usually will not take the time to prepare support materials to accompany instructional television *

Teachers have a waning interest in film

Teachers are increasingly aware of production values

User involvement in adoption, monitoring and evaluation is correlated with successful implementation *

Although scheduling has been a persistent issue, teachers continue to report that the ITV offerings are not convenient in terms of school and classroom rhythms *

There are common goals of instruction and learning among the traditional school persons and the telecommunications specialists *

A lack of knowledge of existing telecommunication resources is a concern at every level of educational decision making *

Detailed evidence that instructional television, for example, can make a difference in providing otherwise unavailable quality programming for schools should be widely publicized *

Institutional Level Findings

Schools have been given (and have taken) a great many new tasks during the past generation *

Schools are complex human and social organizations *

There is a lack of congruence between levels of decision making in the school system *

The institutional level of decision making in schools has had relatively little influence upon instruction

Schools report growing gaps in their ability to deliver quality instruction in mathematics, science, and the arts

The quality of much of the curriculum in substantive areas like history, world affairs, and the humanities tends to be mediocre

Research on learning and personality theory, and on human growth and development has been increasing, but remains slow to reach the practitioner and the public *

Teachers usually will not take the time to prepare support materials to accompany instructional television *

User involvement in adoption, monitoring and evaluation is correlated with successful implementation *

Although scheduling has been a persistent issue, teachers continue to report that ITV offerings are not convenient in terms of school and classroom rhythms *

A lack of knowledge of existing telecommunication resources is a concern at every level of educational decision making *

Resources for school instruction are not coordinated for greatest benefit

Allocation of educational resources is irrational and unsystematic

There appears to be insufficient linkage between components of the educational system of organizations (e.g., schools, libraries, youth organizations, instructional television production centers)

There are common goals of instruction and learning among the traditional school persons and the telecommunications specialists *

Instruction and learning are prime concerns of many agencies previously thought to be disparate *

The climate for cooperative ventures may be receptive again, especially in promoting the use of instructional television/technology *

Detailed evidence that instructional television, for example, can make a difference in providing otherwise unavailable quality programming for schools should be widely publicized *

Societal Level Findings

Schooling and politics (national, state, local) are inextricably interwoven

Schools have been given (and have taken) a great many new tasks during the past generation *

Schools are under increased pressure related to accountability

There is a lack of consensus about what schools should do

Schools are complex human and social organizations *

There is a lack of congruence between levels of decision making in the school system *

Policy decisions have paid little attention to telecommunications as a powerful school resource

Current curriculum emphases are upon the basics, i.e., reading and the language arts, writing, and mathematics *

Future emphases are likely to include higher mathematics, history and the social sciences (particularly civics, economics, and world affairs), and the physical and biological sciences *

There is an apparent lack of leadership in the marketing of telecommunications as an important educational tool

Reallocation of telecommunication resources may assist the schools in crisis

Detailed evidence that instructional television, for example, can make a difference in providing otherwise unavailable quality programming for schools should be widely publicized *

Ideological Level Findings

Schools are vulnerable to special interest groups whose members apply political pressures

Schools are in trouble (negative image, increased demands, social changes exerting pressure, changes in student population, changes in family and community, changes in teaching population, changes in roles and functions of teachers)

It is unlikely that schools can change the social order

Schools are more often followers rather than leaders

Pressure for school accountability can result in policies and practices which positively influence the use of telecommunications by teachers and students

Current curriculum emphases are upon the basics, i.e., reading and the language arts, writing, and mathematics *

Future curriculum emphases are likely to include higher mathematics, history and the social sciences (particularly civics, economics, and world affairs), and the physical and biological sciences *

Detailed evidence that instructional television, for example, can make a difference in providing otherwise unavailable quality programming for schools should be publicized widely

II. TOWARD CHANGE IN TELECOMMUNICATIONS PRACTICE IN SCHOOLS
Features of A Staff Development Model

It is only in recent years that systematic scholarly attention has been paid to issues of working with educators such that school improvement occurs with some positive predictability (Berliner & Koehler, 1983). This attention was largely a consequence of the frustration experienced and observed by persons concerned about recreating school programs. The most dramatic examples of the frustration occurred during the 1960's and early 1970's, a time that can be characterized as the curriculum reform period in American schools. Scholars, concerned about the persistence of longstanding conventional classroom practice that flew in the face of new knowledge, went about the complicated business of designing new curricula and proposing new models of school organization. New ways of going about teaching the physical sciences, mathematics, the social sciences -- all were placed on the doorstep of the schoolhouse in the belief that teachers and other educators would adopt them and, thereby, revolutionize instruction. While this was occurring,

proposals for team teaching, open classrooms, and nongraded programs, for example, were also set forth. Although there were instances where the new curricula and the new ways of going about the business of schooling were adopted and, in some cases, maintained in schools, the innovative programs were more often received with little enthusiasm and less commitment for adoption by school systems (Goodlad & Klein, 1974).

What went wrong? The ideas had intellectual appeal and were the products of some of the best minds in the academic disciplines and the world of schooling. There have been many explanations of the dilemma of introducing changes into schools, some of which focus on the school organization itself as an institution incapable of movement. Recent speculation, however, suggests that schools and school people can change and that the process of inducing that change need not be fraught with the degree of peril experienced by the innovators of earlier decades (Griffin, 1983).

The more sanguine view of school change is a consequence of the increasing sensitivity of school leaders and others to the most effective ways to work with teachers and administrators in ongoing school situations. Several major descriptive studies of school change have contributed to this sensitivity and findings from those studies have subsequently been used in experimental ways to cause change to happen (Griffin et al., 1983). These approaches to change are commonly called staff development strategies.

Staff development, by definition, is based on the assumption that a group of people, organized as a school or system staff, can work together toward change, development, as a result of focused attention from institutional leaders. Staff development is not a demand for change by a school leader, it is a process by which people work together toward the mutual solution of problems that are viewed as important. Staff development is not a lonely

endeavor, it is a strategy that calls upon the skills and knowledge of group members in a collegial way. Staff development is not a prescription forced upon some by others, it is the creation of possibilities and options by those who are charged with doing and acting.

The features of staff development presented here were derived from a number of sources (Barth, 1972; Bentzen, 1974; Berman & McLaughlin, 1975; Griffin & Lieberman, 1974; Gross, Giaquinta, & Bernstein, 1971; Hall & Loucks, 1981; Joyce & Showers, 1981; Little, 1981; Tikunoff, Ward, & Griffin, 1979). These studies and proposals have in common the thread of professional interactions among school people rather than the more authoritarian and dogmatic expectation that "directions will be followed." They also have in common the belief that schools are complex organizations and that an understanding of the relation of the person to the organization is critical in going about changing the status quo. Further, they illustrate the positive consequences of working out school problems in school settings, rather than proposing change from a temporal or ideological distance. Last, they demonstrate a belief that teachers and other school-based educators carry with them positive expectations for their work and will, when given the opportunity, exhibit that positive stance in working together toward effective schooling.

Each feature of the proposed staff development model is presented below and discussed briefly through the use of examples.

1. Diagnose school- and classroom-specific regularities. Every school and every classroom has situation-specific regularities that can either impede or assist efforts to change. Schools have schedules, discipline policies, ways of creating classroom groups, etc. Classrooms are characterized by such practices as recitation or group discussion, the use of textbooks or other

instructional media, whole group or individualized instruction, and so on. These regularities are in place and they tend to be persistent. Any attempt to introduce something different into these places must be considered in light of whether or not it will be necessary to alter the regularities or whether the regularities can be used to assist the change. Although it may seem simplistic to some and mindless to others, the fact of a class schedule in a secondary school will get in the way of scheduling and using instructional television, for example. Understanding what the regularities are will, on the other hand, suggest alternative approaches to either class scheduling or ITV program transmission or both that can be worked out in mutually satisfying ways. The key lesson here is to understand the power of school and classroom regularities to help or hinder a change effort. The effective staff developer will consider these regularities and work toward their modification if necessary or toward their maintenance (some regularities are to be valued, it should be remembered).

2. Provide teachers with opportunities to interact with one another about teaching and schooling. Although it would seem to be a necessary requirement of being a member of a school organization, teachers and administrators do not engage consistently in dialogue about their work. Teaching, for example, has been characterized as a "lonely" profession in that teachers tend to spend the largest part of their professional lives separated from other adults and confined to spaces inhabited by students. The persistence of this "eggcrate" organizational structure seriously gets in the way of professional interactions within schools. The person concerned about introducing telecommunications in schools will devise ways to get teachers together to talk about problems and prospects and use the times together to

tap the educators' beliefs and expectations about schooling in general toward the end of using telecommunications as meaningful instructional media.

3. Provide teachers with opportunities to observe one another and to discuss what was observed. In line with the comments about the loneliness of teaching, it is rare for teachers to see other teachers work with students. The ways that teachers come to question their practices and/or make alterations in their working styles tend to be either intuitive or based upon individual inquiry and speculation. It has been shown that the most powerful means for causing teachers to engage in new practices is for them to see other teachers who work differently and, importantly, talk together about the differences. The teacher who is hesitant or unsure about how to go about integrating instructional television, for example, into ongoing instructional programs will, in all likelihood, be less hesitant and more adventurous regarding ITV if opportunities are provided to see other teachers demonstrating exemplary practice. This is significantly different from being a member of an audience at a hardware or software exhibition staged by someone who is presented as an ITV "expert" and who may be believed to be insensitive to the problems of teaching and schooling.

4. Provide teachers with opportunities to plan together. Too often teachers are presented with plans that have been formulated well away from their workplaces. They are then expected to carry out the plans, and change agents are surprised that the plans are not implemented. Although there is some disagreement about whether teachers are professionals (Etzioni, 1966), they tend toward the belief that they are. And one of the hallmarks of being a professional is having some control over work-related activities. This is violated when teachers are treated like automatons and expected to follow directions instead of lead. It is important to acknowledge here the

difference between planning and being provided with assistance for doing the jobs of teaching. Most teachers appreciate the help contained in such documents as program guides for ITV and supplementary materials for student enrichment to accompany programs. They do not, however, appreciate being told that such guides or materials must be used in certain ways at certain times and with little or no variation expected. What is meant by planning here is the provision of time and support for teachers to engage in decision making and action about how instruction should or can take place. This may mean decisions about how to use what with whom in relation to an ITV schedule. It may mean the more significant contribution of providing ongoing advice to ITV producers and programmers regarding what is needed in instructional programs.

5. Provide teachers with feedback that is objective, concrete, and focused. In the course of working with teachers, school administrators and others have reason to communicate judgments about the teachers' abilities. Too often this information is couched in language that is subjective ("I wouldn't have taught that lesson the way you did"), abstract ("The teacher wasn't very exciting in his presentation"), or lacking in focus ("I thought the lesson could have gone better"). These comments, whether or not they were meant well, are not very helpful to teachers. Research has shown that teachers are very responsive to precise and objectively presented responses to their work. The difference here is illustrated by the distance between "You do too much lecturing" and "I noted that students spoke only three times during the hour -- what do you think of that?" Many teachers have come to think of themselves somewhat as victims of a system of supervision and evaluation that is based solely on the personal, rather than professional, impressions of authorities in the system. And, when one examines evaluation instruments used to gather data about teaching, one is struck with the

possibility that victimization is a possibility. In recent years, the growing, although not yet widespread, use of procedures that collect factual, objective information about teaching activities has been seen to be more productive in terms of teacher responsiveness at both personal and professional levels of interaction. For persons concerned with promoting effective use of telecommunications, it will be necessary to design methods of reinforcing positive use behaviors and calling objective attention to less positive ones. Concerted attention to positive and objective means to accomplish this goal will redound to the benefit of teachers and those concerned with telecommunications as teaching tools.

6. Use teacher time to deal with teacher problems, issues, and concerns (rather than with administrative, routine, or procedural matters). It is not news that teachers consider their tasks to be more concerned with "paperwork" than is necessary. That belief is reinforced through the need to provide documentation for local, state, and federal special programs, the regularities of roll keeping and entering grades on report cards, keeping track of who paid for lunch money, and the like. Teachers, quite rightly, believe that these activities are clerical rather than professional and that they take time away from more important curriculum planning and instructional responsibilities. Added to this "administrivia" is the tendency for some school administrators and consultants to use teacher time to deal with issues far removed from the actual acts of teaching. It has been noted in several studies that the more that teachers believe that their time is used for the purposes of promoting quality instruction, rather than promoting management of the school or system, the more likely it is that they will engage positively in the activity and contribute their knowledge and skills to the change under consideration. In terms of telecommunications in the schools, this means that those charged with

introducing the programs into schools and classrooms should spend their time linking the new instructional medium to what teachers care about, what they find problemmatic, what concerns them. This means turning a sensitive ear to teachers' talk and responding to that talk directly and straightforwardly in terms of the innovation. It does not mean ignoring teachers' concerns because they display ignorance or misunderstanding of telecommunications systems.

8. Adapt staff development behavior according to personal and organizational characteristics of "users" and work with teachers on their own adaptation of teaching strategies according to the characteristics of students, classrooms, and schools. As noted earlier in this report, the curriculum reform movement of the 1960's and early 1970's was characterized by the belief held by certain scholars that the innovations were denied entrance into school programs because of some implicit or explicit recalcitrance on the part of school programs. The guidelines for staff development presented here have focussed mainly on how to work with teachers such that professional dignity and integrity can be maintained. When one examines the need for this dignity in light of the fact that one wants to make a change in classroom practices, one has to come to the conclusion that there will be some adaptation or compromise from all parties. On the one hand, the teachers and administrators will be expected to make some major or minor shifts in the way they accomplish their missions. On the other, innovators (e.g., telecommunications specialists) will be required to modify certain of their demands on the system. This process is called mutual adaptation and has been found to be positively and powerfully related to the degree to which changes take place in schools. The change agent who demands absolute fidelity in the acting out of his or her proposal for change, without taking into account the expectations, concerns, and time-tested practices of teachers and other school

persons will more than likely end up holding a beautiful package of telecommunications materials and be unable to testify that the package made any difference in the lives of students. Conversely, the telecommunications specialist who recognizes that it will almost certainly be necessary to make modifications in the package as he or she learns about the culture of the schools into which it is introduced will be able to display a modified package and provide evidence that it is, in somewhat different form than originally intended, in place in classrooms. At the same time, teachers and administrators who see that the change agent is willing to account in the innovation for their concerns and practices and beliefs will be positively disposed to both helping in the adaptation process and testing out the consequences of the innovation.

9. Demonstrate knowledge of the consequences of using the innovation. There has been a growing tendency on the part of school people to be skeptical of what might be called the "snake oil" approach to educational change. Too many solutions have been proposed in response to persistent problems. Too many of these solutions have failed. Too many "experts" have told teachers what to do. And too many of the experts' panaceas have fallen short of the mark. Teachers and administrators have grown more and more receptive to the use of evidence. If that evidence can be supported in terms of rigorous research, all the better. If the evidence is comprised of evaluation data, fine. But, the presence of evidence is consistently related to a positive receptivity to a proposal for school change. The nature of the evidence is also important. It is far more convincing to a teacher or school official to be told, in concrete terms, that the evidence was derived from settings much like his or hers. The teacher who is convinced that telecommunications systems have been associated with a rise in achievement scores in schools like

his or hers and with students who have the same characteristics as the ones in his or her classroom will be more disposed to trying something new. It is, however, necessary to remember that school people will discard evidence that does not "match" the publicly articulated purposes of the program. If a piece of software is designed to increase mathematics computation scores on standardized tests, do not talk about how many teachers liked the program, talk about how many students, under what conditions and with what characteristics, actually demonstrated achievement gain. The key here is to use appropriate evidence, not just the evidence that is available. (Of course, in the design of a new program, one of the key features of that design should be the systematic collection of evidence to support program claims and to use that evidence in disseminating the program to schools.)

10. Link teachers to technical assistance outside the immediate school environment. Although there is a strong belief that school improvement should focus upon the individual school and that most of the solutions to school problems can be found within the immediate school environment (see below), there are often school change efforts that, by necessity, must be reinforced from stimuli outside the school. Telecommunications innovations, we believe, are in this latter category. Teachers and administrators, working together, will, of course, come up with solutions to problems of use in terms of fitting the innovation into the existing regularities and adapting the innovation to the conditions of the school culture. They will need reinforcement and substantive help, however, from outside the school. A good example of this kind of technical assistance can be found in the increasingly positive responses to the personal computer advertisements that guarantee both initial and continuing assistance in the use of the hardware and software. This

"hotline" approach to school improvement has been tried and has been found to be positively associated with the success of the efforts.

11. Diagnose individual and group concerns of users. A significant amount of research and development work in schools has demonstrated that giving attention to the concerns of potential users of an educational change pays enormous dividends. Although "concerns theory" has developed into a very sophisticated taxonomy, both substantively and methodologically, it is enough for this discussion to note that educators appear to move through three stages of concerns regarding changing practice. The first concern is for self. At this stage, the user of the innovation is primarily interested in how the innovation will impact upon him or her, how he or she will have to know new things, do new activities, learn new skills. It is a highly personal level and has little or nothing to do with actually using the innovation. The second stage has to do with task. A person at this stage is concerned about how to do the new thing, how to accomplish the jobs of the innovation. The concerns tend to be administrative and managerial. The third stage is impact. It is at this stage that the user has learned how he or she fits with the innovation, how to get the routines of the job done, how to almost automatically do the new job. Instead of being concerned about these issues, the user is thinking about how what he or she does affects clients. In the case of ITV, for instance, a person at the impact level of concern is raising questions about what difference the program is making in the learning of students, in their academic and social accomplishments. The innovator who carefully attends to whether individuals or groups are at self, task, or impact concern levels will be able to make decisions about how to work with those people. (For example, a school faculty at self concern levels will need to have access to a substantial amount of information, from human sources as

well as print or video, and should not be pushed into doing the work of the change. Persons at task levels will need a good deal of help in getting the job done, developing and managing classroom routines, dealing with paperwork and record keeping, and the like. Persons at the impact level will be raising questions, searching for evidence, suggesting alternative ways of using the innovation. It is the people at this last level who can be most helpful to developers in that they will have insights for revisions, adaptations, and mocifications of existing programs.)

12. Provide consistent, ongoing assistance. This is self-explanatory and has a commonsense ring to it. Unfortunately, observations of practice suggest that it is quite typical for school officials or others to do a so-called "front loaded" workshop or inservice education session and then leave the teachers to flounder. Anyone interested in moving telecommunications into central instructional positions in schools must be ready to commit considerable time and energy to "hovering" around the teachers and the innovation until there is evidence that gradual withdrawal will not result in sets of dusty equipment and unused software. At the same time, if the change agent takes seriously the guidelines that preceded this one, he or she will not just be there for the sake of being there. He or she will be diagnosing stages of concern, acting upon observations, working on interpreting the regularities of the situation, engaging teachers and administrators in planning and reflecting activities, and the like.

13. Work with identifiable organizational entities, preferably entire school staffs. Earlier, it was noted that there is the belief that working with the school as the unit for change is potentially more powerful than focussing on other organizational components. In order to accomplish an educational change, it is important to recognize that the school is a whole

even though it is part of a larger system. When one recognizes that the school has all of the educational variables present in an educational setting (i.e., administrators, support staff, students, materials of instruction, teachers, parents, etc.), it is logical to use the school as the unit for change. All of the system variables can be observed and all can be manipulated (in the best sense of that word) toward the accomplishment of desired ends. To work with individual teachers is to compartmentalize and isolate the innovation. To work with school administrators is to place the innovation at a system level where it has little or no direct impact on students. To work only with students is to ignore the fact that teachers control instruction. And so forth. When one recognizes that the school functions as a consequence of the interaction of all of its human elements one can "see" the school as the logical focus for one's innovative activities. This, of course, calls for a sensitivity to the nature of schools as relatively uncoordinated organizations. This means that the change agent will need to work systematically toward the development of coordinated efforts. Oddly enough, a school's human components can more willingly rally round something new and untried as a cohesive group than they can around something that is a part of the tradition of the setting and that already has its adherents and opponents. The introduction of a coordinated telecommunications system into a school through the development of a carefully orchestrated set of opportunities for collegial problem solving, planning, action, and reflection has both intellectual appeal and practical power.

This section of the report has presented a summary, in the form of a set of features, of recent inquiry and proposition regarding working with schools such that school improvement can take place. Certainly, there is nothing new or startlingly novel about these features. What may be new is the

recommendation, strongly advanced here, to use these features as coordinated components of an overall strategy for school change. Each of them has some appeal, conceptualizing them all as mutually reinforcing has enormous potential for introducing and maintaining telecommunications as school-based instructional systems.

The Concept and Operation of Support Systems

The first report which grew out of the research done by Designs for Education, called Telecommunications and the Schools, noted that "some simple but basic assumptions form the foundation for the rationale and approach to the study." The concept and operation of support systems are built on the first two of the assumptions which read:

". . . schools and teaching are complex entities which are little understood despite the length of time each of these entities has been around. . .", and,

". . . the design and function of schools are intimately related to the society they serve."

These assumptions bear directly, we believe, upon the difficulty most teachers and schools have when the task is to modify a regular modus vivendi -- in this case to install and use telecommunications as a standard and integral curricular and instructional component in the everyday classroom. Bootstrap operations are notoriously tough. Teachers need help, but so do the systems which sustain them. This kind of help, in many forms, both internally and externally is a professional support system -- technical assistance, if you will, whose object is to assist teachers, schools, administrators, and policy makers as they undertake the hard job of changing their practice and acquiring new attitudes, knowledge, and skills.

How might the support system essential to change in school attitudes toward telecommunications look? What do we know that could be of use in its design and operation?

The four data sources mentioned earlier are a good place to begin. The first of these are values. They are already implicit in the goals for the enterprise, namely, that it is educationally desirable for telecommunications to take a central place in the usual array of instructional resources and become a much larger force in everyday classroom practice for both teachers and students. We believe that such an incorporation into the heart of the classroom can improve the teaching-learning process as well as the quality of what is learned, providing teachers and students have access to the best of telecommunications materials for children and young people. We are asking that telecommunications become institutionalized in the schools. Thus our values are inherent in the goals of the design.

To construct a conceptual model of a relevant support system for teachers and schools we also need professional information (funded knowledge and conventional wisdom) and professional tools (craft). Report I, which focused on the nature and meaning of the findings of our research, contains a great deal of information. There are papers about the school and society, the school as an institution, the curriculum, teachers and teaching, schools and technology, and technology and learning. These, plus discussions of findings on these topics and on a new area called resources and inter-institutional relationships, form a considerable body of knowledge, craft, and professional interpretation of the data.

The beginning section of this essay has outlined several more areas of knowledge and craft, with more emphasis in this report on some important technical aspects needed by those who would design and operate the system.

Among these are a framework or conceptual scheme articulated by Goodlad which clarifies several levels of decision making within a school system; an explanation of Tyler's scheme for sorting out and putting together the components of a well-designed curriculum (valuable for people who are developing and producing educational video and computer course material); and the presentation of a tested staff development model which makes practical suggestions, based on field research, for would-be technical assistance experts. Thus the two reports, taken together, represent a formidable array of knowledge about the schools, about telecommunications, about relationships between the two, and about the state of the art in professional craft. A possible addition to this array of knowledge and craft is the literature about curriculum change and about change in classroom instructional practice, although much of this material has formed a backdrop for many of the ideas, activities, and discussions contained in the full two-part report.

The problem now is to put it all together in a form which can be of use to the designer, producer, developer and utilization promoter of telecommunications in the schools.

As the Goodlad conceptual scheme notes, there are three layers of decision making which make up the schools and school systems: the instructional, the institutional and the societal, each of which has an impact upon the classroom and upon the students. Each layer or level exists in the same ideological sea, that is in a world much influenced by socio-economic-political trends and by our habits and ethos as an American culture. For example, our American socio-economic-political world is subject to rather precipitant pendulum swings from liberal to conservative, a generalization that can be documented easily by the history student. As a

people, we tend to be pragmatic and impatient. All of these tendencies affect the schools in one way or another.

A different kind of push on the ideological front comes from the intellectual and research oriented sector of society. Excellent analytic and creative minds do examine the state of education and learning and can affect the knowledge and idea base from which schools work. For example, three famous psychologists come to mind who have affected the ways schools work. Jerome Bruner's studies of thinking, Jean Piaget's research into developmental levels of cognition in children, and B. F. Skinner's behavioral contributions to stimulus-response and positive reinforcement theory have all made their marks on the way people think about schools and learning. At a more abstract level, the logical positivists and phenomenologists have influenced not only the world of philosophy, but also the school world. And more immediately, we are aware of a plethora of studies about the American high school, which will undoubtedly have some influence on the ways in which high schools change in the next several years.

This ideological world does not make formal decisions about the schools, but it does, as we have seen, exert a great deal of subtle (and sometimes not so subtle) power on all three decision-making layers within the schools. Our studies indicate that there is lack of operational congruence among the decision making bodies and that the institutional level has so far had little influence on teachers and on instruction. Since most change efforts have been aimed at teachers, this relative lack of power of the institutional level to help the teacher accommodate to the change is disturbing.

It is very important for this support system model that Goodlad's three layers be arranged so that the instructional (teacher-student) layer becomes the primary target group. That is to say, the function of the institutional

level is to supply the educational needs of teachers (and through them the students), and the function of the societal level, in addition to policy making, is to support the ability of the institutional (school and school system) level to sustain and assist the instructional level. This is a reversal of the usual hierarchical view of the school system where mandates and value judgments are made for teachers and passed down through a chain of command.

As a parenthesis at this point, we should note that organizing and following through on the operation of a support system is not the sole function of Goodlad's levels of decision making. They also have duties relating to the translation of board policy into operational form and are thus charged with such tasks as managing, monitoring, and evaluating the system, and with regular personnel evaluations. It is helpful if the support function can be in the hands of people not involved in the monitoring and evaluative functions, though this separation becomes more and more difficult as funds have become tighter.

A support system, on the other hand, recognizes the power, autonomy, and isolation of the classroom teacher and the importance of the school as a cooperating unit. It offers opportunities for acquiring new knowledge and skills in a non-threatening environment, easy access to necessary technology and instructional materials, colleagueship and feedback, encouragement when the going is rough, and recognition for progress and achievement. A support system persuades and promotes rather than mandates. It pays a great deal of attention to the series of staff development features outlined in the previous section of this report, not only to the specifics described, but particularly to the attitude it espouses. To repeat, staff development is not a demand for

change by a school leaders. It is a process by which people work together toward the mutual solution of problems that are viewed as important.

The education of a school system, however, does not stop with the provision of staff development for teachers. Each decision making group needs a special kind of "curriculum" and "instruction" tailored to its special responsibilities and functions. Obviously, we are using "curriculum, instruction, and staff development" as generic rather than literal terms. The support system for the societal level, for instance, probably offers relatively few formal courses or staff development sessions. Rather, a variety of approaches should be included in the total three dimensional effort such as lectures from experts, orientation sessions, group discussions, promotion documents and media events, visitation to other schools and school systems, provision of relevant books and articles, telecommunications programs, and so forth. Further, it is not necessary for each "student" in the support system to attain the same degree of proficiency in each area of study.

It is useful to differentiate between what we have called a literacy level of achievement and one called a performance competency level -- between knowing about something and knowing how to do something. Achievement at the competency level requires, quite obviously, a much higher level of mastery than that of literacy. Students hoping to reach performance levels should be "sold" enough emotionally to persist through the command of both practice and theory and eventually be able both to demonstrate the knowledge or skill learned and to teach them to others.

The curriculums to be learned by members of the school system also differ from one level to another, though more in specificity and intensity than in basic content and process. For example, if one had a new telecommunications

course in geometry to help schools manage a shortage of qualified mathematics teachers, and to upgrade the teaching of geometry in general, it would be important to help parents, the community, and the board of education (societal level) to gain an appreciation and understanding of the place of geometry in our culture, its value, artistically as well as economically, and to create a political climate and hunger for this type of instructional innovation. This curriculum could and should have an intellectual element -- some exposure to the major ideas and processes which characterize geometry as a discipline; an element which acquaints the audience with geometry's value to the individual and to society in terms of application of this knowledge and point of view and as a base for further study; an element which explains the need for adequate, and easily accessible resources such as telecommunications equipment, related texts, and so forth; an element which treats the importance of funding for staff development and project evaluation; an element which comments on society's responsibility for provision of adequate funding, and adequate rewards and recognition for teachers and administrators who venture to incorporate a new course into classrooms; and an element which encourages and makes provision for continuous communication between the community and the school.

The elements of this curriculum for the societal level of decision making can be organized in different forms. Some can be addressed by promotion and general informational techniques, others by brochures and other print materials, others through adult telecommunications efforts, and so forth. There are many variations. The point is that this educational effort must be intentional, well timed, fully planned, and fully funded. It is more than a public relations effort, although many public relations marketing strategies may be very useful tools.

Most of this societal educational effort should be pitched at the literacy level of achievement, although boards of education probably need more than literacy to cope with such matters as the development of curricular and instructional policy, the establishment of general educational goals for the system, the relation of budget decisions to institutional and instructional support with respect to personnel and resources, and the nature of effective school system evaluation. (The accountability movement is part of an attempt at systematic evaluation of school systems and has run into difficulty not because schools should not be accountable, but because of the movement's great dependence on over-simplified instrumental measures. Boards of education, in this instance, need to understand and differentiate between instruments which answer relatively simple questions about the quality of educational offerings and practice and methods of approach which are less exact, but more valid and realistic. Both kinds of appraisal are important.)

Another possible and complementary approach to the matter of involving the adult population in the concerns of schooling is the design and development of materials of instruction which are of interest to adults as well as to young people. Telecommunications is a powerful tool for bridging this gap. (The NOVA Public Broadcasting System programs are cases in point.) Let us follow through with the hypothetical telecommunications course in geometry mentioned earlier. It <u>is</u> possible, we believe, to design a geometry program with several interlocking and reinforcing layers. Thus a more or less formal academic course in geometry for schools could be accompanied by an offering for general home consumption, attractive to a range of ages. The latter could teach geometry as a general liberal arts subject and still touch on the basic structure of geometry as a discipline. Such parallel offerings could enhance and support each other. If that juxtaposition worked,

consideration could be given to a third layer, perhaps to the exploration of vocational and professional careers which are related to the study of geometry. These are strategies which grow out of our belief that improving the quality of schooling for children and young people is highly dependent on improving the education of the adults who bear responsibility for schools -- the public as well as the professionals.

Let us now turn to the group of professionals who are charged with the task of administering, managing, and supporting the schools -- the institutional level of decision making. Remember that this institutional level has not seemed to make much of a difference in the quality of teaching, whether this layer of decision making takes place at the school itself as the principal and faculty work together on matters relating to the quality of the institution as a whole, or whether decisions are made with the help of experts from a central office, teacher center, or university. As far as the idea of a support system is concerned, the institutional level of decision making's task is to bring to teachers and administrators the best possible knowledge and skill about curriculum in all areas of study, about resources, including telecommunications materials as well as print, and about proven methods of instruction and classroom organization. These are the specialists, professionals who represent mastery of their field of expertise, whether it be subject matter, research, measurement and evaluation, child and human development, the teaching-learning process, administration, or staff development. This, incidentally, is the group to which most telecommunications people belong, whether they be developers, producers, and promoters of instructional material, or members of local ITV stations or school based media personnel.

In many large school systems the professionals charged with these kinds of expert help to the schools are in residence at central or regional offices. In others they must be "borrowed" from local universities or teacher centers. Still others are unable to offer any help of this kind. It is expensive, and has been the target of many cuts as school budgets are further and further squeezed.

The reasons why the support for teachers and instruction at the institutional level has been largely ineffectual are many. In the first place, such support from experts may not exist. When it does exist, it may not know how to sustain the technical assistance required and may not have access to the most recent action research in this area of investigation. Or, its experts may not really be people who have mastered their fields of expertise. Or their management and monitoring duties may absorb too much of their time. Or, they may be spread too thin. Or, they may have trouble acting in collaboration with their colleagues. Or, with a change of local or regional political wind, their basic mission may be altered.

Whatever may be the nature of their trouble, their curriculum should be designed to help them enhance their ability to make a difference in schools -- to become excellent technical assistance experts who understand the nature of the institution with which they are dealing and so to become helpers not only in their field of expertise but also in the task of institution building. This curriculum could well consist of the information and ideas included in both these DFE reports, particularly the technical sectors of this report. This knowledge should be mastered by experts representing this layer of institutional decision making. The goal is performance competency at the highest level.

There is something to be said for institutional level support being based outside rather than inside the school system, since an outsider has more chance of being apolitical as far as school or school system internal politics are concerned and can more easily be divorced from the tasks of personnel evaluations and monitoring the system itself. But whatever the local arrangements are, it is most important for telecommunications specialists to understand internal patterns and dynamics so that they can organize appropriate collaborative efforts in the planning, execution, and evaluation of their attempts to help school based teachers and administrators. They need the chance to work directly with media specialists and librarians, and to plan the launching of telecommunications programs with school system curriculum patterns and with allied staff development opportunities for local school people. They will also need to keep abreast of such school and school system program evaluations as may exist.

Designers, developers, and producers of telecommunications are not directly related to students, teachers, and schools in an ongoing fashion. If their products are to be used by teachers and schools, they need (at a literacy level of competence) to know a great deal about the internal nature of teachers, schools, classrooms, and school systems, and to understand the mechanisms through which they operate. Much of this specialized knowledge, moreover, needs to be considered as the product is designed and developed, and built into the finished program or series of programs. And they need to have access to the same kinds of expertise as does the institutional level of operation.

Designers, developers, and producers of telecommunication products have, it appears to us, another exciting potential which is underdeveloped at this time. It is exciting because it has the power to create, replace, or

supplement the kinds of "curriculums" for teachers, administrators, professional experts, and policy makers we have outlined in the preceding section. In other words, they could produce the staff development products intended not only to accompany their curricular products, but also for more general consumption by the schools and by the school community. As such they could fill a widening gap at the institutional level and be instrumental in producing the tools for schools and school systems so that they could really manage a boot strap operation. It is a dream which should not be cast aside lightly.

Finally, we turn to the instructional level of decision making -- those decisions made by the teacher in a myriad of everyday encounters for and with students. This, as noted earlier, is the primary target group of a well ordered support system. The sections which precede this one have described the energizing and education of the societal and institutional levels so that they can be better focussed on the primary target and better able to help rather than to hinder the ongoing work of the teacher.

The teachers' (instructional level) process of decision making for the classroom needs support in the same areas as do the institutional and societal levels. For example, a goal of the support system with respect to intellectual content is teacher command at the competency level of the subject to be taught. The aim is for professional competence also in teacher ability to manage the environment of the classroom; to provide, allocate, and guide the use of resources (including the equipment and programs needed by a telecommunications component for learning); to communicate with differing levels of student ability and interest as well as with fellow teachers, administrators, and parents; to understand the internal politics of the school system and the community it serves; to know oneself professionally so that one

welcomes staff development support in areas of weakness; and to evaluate and articulate both the progress of students and the outcomes of given teaching-learning procedures, incidents, and programs.

Different teachers will need more support in one area than others. For example, a teacher may know a great deal about mathematics but have little idea about how to communicate this knowledge. Other teachers may be able to organize an inviting and effective environment for learning, but be unable to recognize deficiencies in intellectual command of the subject either in themselves or in their students. In such cases the institutional support system needs to modulate its staff development efforts to suit the individual or group of individuals.

Another way to look at teacher needs for support is to remember three types of activity in which any teacher who calls himself a professional must engage. Teachers must first have some idea about what they want to do, then they must do it, and then they must find out if the activity worked (helped students learn) so plans can be modified the second time around. If considered in terms of a sequence of activities, we note three components which are repeated again and again, namely, planning, operation, and evaluation.

The planning activity requires that the teacher integrate a great deal of knowledge about the subject matter to be taught, about values, about societal needs, pressures, and political moods, about human development and learning, about teaching strategies and learning environments, and about instructional equipment and material. Teacher plans should reflect an integration of this learning. The planning activity asks for more than a literacy level of attainment accompanied by feedback from previous practice about what works and

what does not. It is the equivalent of an architectural or an engineering drawing.

The actual operation of the plan moves the areas of professional know-how from thinking about and conceptualization to doing -- to demonstrating in action what has been planned. To follow through on the building analogy, it is the actual construction of the house or bridge. It is the real test of whether the plans work or not; whether the classroom management enhances the learning of students or gets in its way; whether teachers are able to modulate their behavior with the plan they have set up for themselves and for their students; whether they are creative and flexible enough to improvise on their feet when the unexpected occurs. Quite naturally, this activity requires the ability to act and later to see oneself and the setting in a relatively detached fashion. Competency at the performance level is the objective.

The third professional activity in which teachers engage over and over again is the generation of feedback about both the process and the product of the learning environment set up for students. It requires command of available evaluative techniques for both students and teachers, as well as the ability to analyze, to draw logical inferences from raw data and to organize such inferences and analyses into a cohesive whole.

The point in examining the task of the teacher in sequence demonstrates not only the way in which the various topics which make up the teachers' "curriculum" for staff development purposes may be put to use, but also to note the differences in approach needed by staff developers who wish to support teacher efforts to upgrade themselves. Thus some sections will lend themselves to direct expository teaching, others require "learning by doing," and still others practice in reflective thinking.

The teachers' task is not an easy one. Teachers can use all the support that can be mustered, providing it is offered to friends and colleagues, not to low people on the totem pole.

The discussion of a support system has thus far focussed on the need to consider decision making and action at levels of the Goodlad conceptual system. It has been recommended that the ideological level influence on telecommunications and schools be acknowledged and understood and that conscious attention be paid to the power of societal and institutional level decision making and action to promote effectiveness at the instructional level. That is, the school system exists, in toto, for the purposes associated with causing positive outcomes of learning and teaching, instructional level activities.

The findings from Volume I of the DFE effort, along with the discussions of curriculum planning, decision making, staff development, and the concept and operation of support systems, lead to the identification of five components of such a support system. The components comprise the foci of the support system, the dimensions that must be included to promote effective development and use of telecommunications programs in schools. These components, if attended to by persons at the three levels of the conceptual system will, we believe, help to guide the work of providing meaningful support to teachers and students in schools. They are (1) intellectual, (2) management of the environment, (3) provision, allocation, and use of resources, (4) evaluation, and (5) communication. The roles of these components can be inferred from examination of Figure 3. It can be seen that if one paid attention to the components in relation to the levels of the guiding framework, it would be necessary to address issues at each of the intersections of level and component (e.g., the relation of the institutional

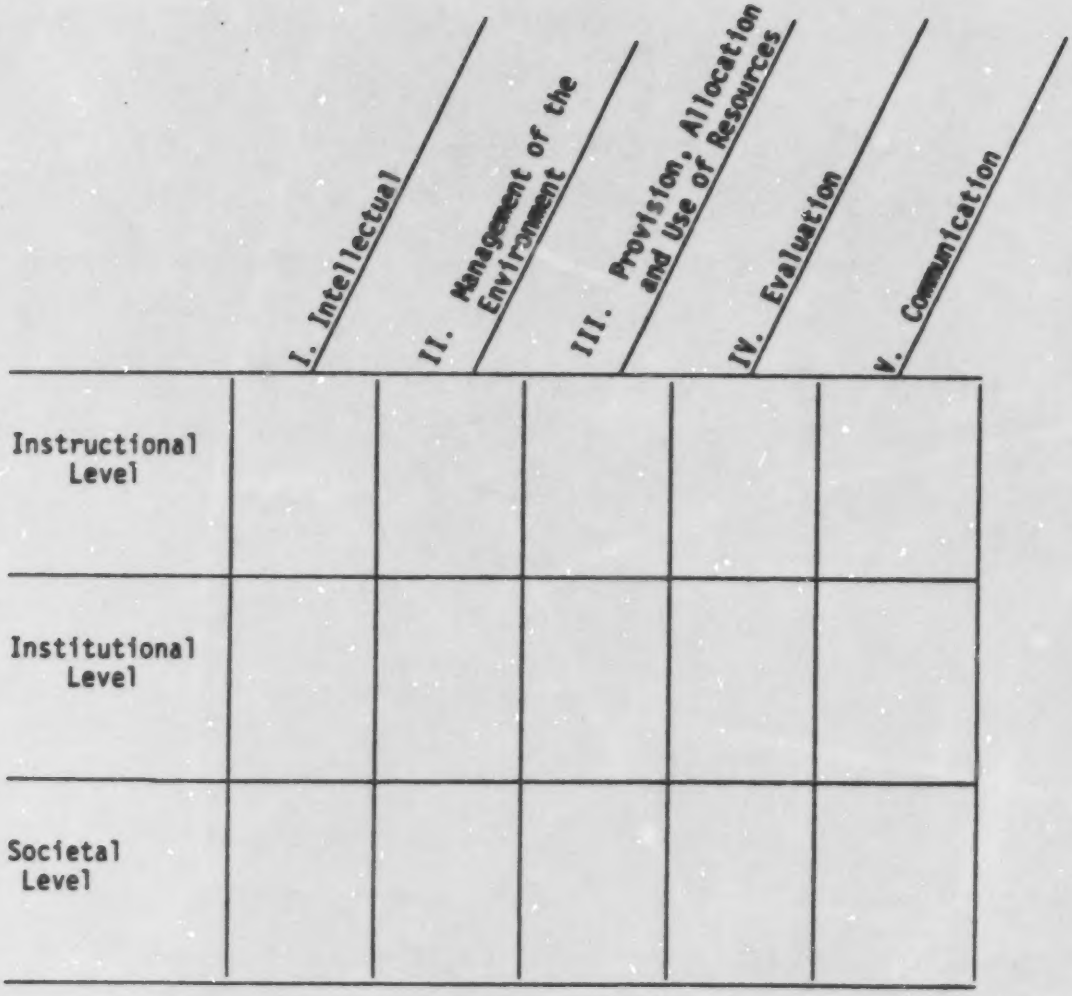


Figure 3. Elements of a support system for introducing telecommunications programs into schools.

level and the management of the environment, the relation of the instructional level and evaluation, etc.). Because the components proposed here for inclusion in a support network are, in some instances, more complicated than conventional language usage might suggest, each will be discussed briefly.

Support System Component I: The Intellectual. This includes consideration of the competence and content that are necessary or desired to provide academic and professional integrity for school offerings. The most conventional manner used to demonstrate this component is made up of the materials of instruction such as texts, ITV programming, graphic representations, realia, and the like. This look at the intellectual "stuff" of schools is, we believe, insufficient for several reasons. It presupposes knowledge and skill that may not be adequately developed. It assumes that teachers, in the main, have inclination and energy for gaining access to and becoming competent in advances of knowledge. It ignores the intellectual nature of school people while concentrating on the intellectual development of the student. And, most seriously, it leaves the issues of what is to be learned about and how to do to the instructional level, absolving others in the system of the responsibility to deal directly with the heart of instruction.

Including the intellectual component in the support system forces an answer to the old question, "What knowledge is of most worth?" and the newer one, "What can schools accomplish?" Further, its inclusion promotes the possibilities inherent in the concepts of academic collegiality and focussed professional interaction. School persons who come together to debate and decide about the content and competence to be addressed by curricular and instructional programs will, we believe, come to grips with the purposes of

schools, the expectations for schooling, the prospects of pedagogy, and their own intellectual development.

But, the intellectual component of the support system suggests more than a meeting of minds across the levels of the system, it advances the proposition that the levels of the system can have unique functions related to the intellectual thrust of schooling. Central to the school organization's business is dialogue, talk about the organization and its work. This dialogue is, we believe, largely intellectual in nature. Beyond the dialogue among school people, however, is the societal level's commitment to dialogue, the institutional level's provision of a mechanism to support and sustain dialogue, and the instructional level's willingness and ability to take action related to the dialogue. The focus on the intellectual also reinforces the professionalism of participants in the process; it assumes that school people have ideas that are valuable and valued. It provides an arena for thinking with others about the important work of schools. And, it provides participants with the opportunity learn from peers and other colleagues.

It may appear that the intellectual component of the support system is conceived of only as a forum for the sharing of personal prejudices, beliefs, and values. That is not the intention, although this human activity is a part of the basis for inclusion. Beyond this limited conception, however, is the belief that attention to an intellectual component will lead to the development or discovery of resources for decision and action <u>outside</u> the boundaries of the school setting. An example of this could be the use by school persons of a comprehensive survey of telecommunications products such as the one assembled by DFE as part of its work on new telecommunications programs in mathematics. The utilization of important intellectual products

and tools after the need for such use has been identified is part and parcel of focussing on an intellectual component of the support system.

The intellectual component, then, (1) provides for school people a focus on the content and competence to be included in curriculum and instruction, (2) makes available opportunities for dialogue, decision, and action among practicing educators, (3) locates responsibility for the facilitation of such opportunities in the school system, and (4) acknowledges that intellectual needs of both individuals and the system can be met by adopting or adapting resources from outside as well as inside the school setting.

Support System Component II: Management of the Environment. As with the intellectual component, the management component is typically confined to the organization and management of instructional settings such as classrooms. This narrow focus must be dismissed as inadequate when one examines schools as interacting levels of decision and action as this report has. The term environment, as used here, means the related levels of schooling that are all acting toward accomplishing the goals of learning. Using such a conception, it is clear that, in addition to managing classroom activities and students, there is a need to manage efficiently and effectively the larger "surround" of the school and the system. Embedded in this larger context are expectations for schools, values about content and pedagogy, and other influential phenomena. These must be attended to.

Schools and school systems can be considered as analogous to the better-understood classrooms if the position is taken that all three environments do (or should) contain or give consideration to the elements of the schooling enterprise, even though that consideration may be more abstract at the system level, for instance, than in the classroom. All are (or should be) concerned about instructional materials, the orderly and rational

arrangement of people and ideas in space, the accessibility of needed resources -- the organization of the elements of a learning environment such that learning is ensured for adults as well as students. The responsibilities at the several levels, of course, differ in intensity and, occasionally, in kind. The societal level provides oversight of and support for the work of the other levels. The institutional level provides options and direction, the instructional level selects and implements as well as provides data bases to the other levels regarding the best (or better) ways that the larger environment of the system can enhance the work of the smaller environment, the classroom.

An example of this interaction regarding management of the environment can be found in a set of coordinated efforts around a conventional school (and curricular) issue, the articulation of subject matter across grade levels. Often, there is continued dismay and discontent because either (a) students don't know what they are "supposed" to know when reaching a certain point in the school system or (b) students have already covered what is "supposed" to be taught at another point in the system. This issue is dramatically observed in the rush of elementary school teachers to "get students ready for junior high school" or high school teachers who recognize that 10th grade students have not mastered certain fundamentals but do little about the problem because "someone else should have taught them." These are examples of poorly managed learning environments at several levels of the system.

A well-managed environment, using the same example of the discontented 10th grade teachers, would have set forth public expectations for learning at the several school levels through societal decision making, provided options for accomplishing those expectations through action at the institutional level, and made certain that the learning took place at the instructional

level. And, if concerted attempts to accomplish the learnings appeared to have failed, system-wide deliberation would have taken place to determine where the barriers to learning were located. It may have been that the expectations were not realistic or that the institutional level facilitation devices were not adequate or that some or many teachers simply did not teach to the expectations. In any of these instances, a support mechanism as discussed here would have led to the provision of corrective measures.

As can be readily seen, management of the environment in this discussion is a good deal more than manipulation of a physical place and the things in it, although that certainly is a part of the concept. It is believed, however, that a support system that concentrates effort on management of places, people, ideas, and intentions in a concerted effort to make differences in the lives of students is a more reasonable proposition in terms of the missions of schools as societal instruments.

Support System Component III: Provision, Allocation, and Use of Resources. It is axiomatic that schools are places of intellectual resources but it is less widely-understood as to how the decisions regarding the allocation and use of those resources are to be made. It is not unusual to observe that one school in a system is resource-rich and another is resource-poor. It is also not surprising to school-wise people when they see resources used in one building and the same kinds of resources lying unused in another. These observations and others like them confirm the conclusion that the school system, or instructional support system, is often uncoordinated and fragmented.

As is true of the other components, this one is acted out differently at the various levels of the system but the actions are part of a coordinated whole and when lack of coordination becomes apparent, corrections are

introduced until the conflict is lessened or eliminated. Resource provision is largely a function of the societal level in the form of authorization of funds for such common resources as textbooks for students or less-common graduate level tuition credits for teachers. These provision decisions are informed by dialogue with and among teachers, administrators and, often, community members and are based on public acknowledgment of the needs and expectations for both students and educational professionals in the system. The institutional level develops, maintains, and monitors both the information and allocation mechanisms by providing dialogue-inducing opportunities and distribution systems based on clear and deep understanding of system priorities and consequences. The instructional level engages in use, particularly of curricular and instructional resources, and participates in the ongoing deliberations about necessary resources and optimal distribution and allocation means. A major function of the instructional level here is the provision of important and necessary information regarding the consequences of resource use. In a system such as the one proposed here, the remarks of the 10th grade teachers about inadequately prepared students, as noted above, would lead to a re-examination of resources in terms of allocation, use, and consequences as well as expectations for use.

Support System Component IV: Evaluation. Implicit in much of the discussion in this section of the report is the need for evaluative activity. Unfortunately, evaluation is an often-used and frequently misunderstood term. It is too frequently considered as a synonym for judgment and less frequently as a system of thought and technology used to arrive at those judgments. It is the latter definition that is used here.

An evaluation component of this support system is meant to direct decision makers to the important activities associated with determining what

is effective for accomplishing certain ends and what is less effective. Evaluation should be a pervasive theme in all purposeful activity, and we believe that schooling is a purposeful activity. In the instance of designing telecommunications programs for use in schools, it is important to collect information systematically over time so that decisions about directions for the future can be made more meaningful because of what has been learned in the past. Production decisions can be made in light of information collected in past (or current) efforts and, certainly, use decisions should be made in light of information about the outcomes associated with use.

Using evaluation as a focus for decision making and action in this support system leads to consideration of criteria for judgment, articulation of purpose, learning outcomes, satisfaction with the curricular and instructional elements of a program, cost effectiveness, and so on. Of course, the purpose and practices of evaluation will depend upon which level of the support system introduces and/or uses them. Societal level persons may be concerned with issues of cost effectiveness rather than satisfaction with a program. Institutional level persons may be highly concerned with the degree of use by teachers of a program. Instructional level persons may be most concerned about the way the program does or does not "fit" into already existing curriculum and instructional patterns and structures. All, of course, should be concerned with the outcomes of use; the impact of the program on the student who comes in contact with it. The focus on evaluation, then, is considered central to the support system as a means to make judgments about effectiveness and consequences of the other components of the system as well as the program of instruction that the system is designed to enhance.

Support System Component V: Communication. Schools are human organizations and social institutions. Consequently, the functions and

activities of schooling are language-bound. In order to carry forward and account for the work of schools a communication system must be in place. None of this is surprising. What is surprising is the relatively small degree of attention given to the need for and nature of communication in providing support for instruction and, in this instance, instructional innovation in the form of telecommunications programs.

The support system proposed here includes the communication component as a means to emphasize the importance communication has in school activity. It is necessary for school people to know about and how to do the work of schools. Many times, especially in the cases where that work is different from past practices, schools must develop systems of providing information that do not assume knowledge and expertise by receivers. In a support system such as this one, the communication component must be built upon a different set of assumptions than is the case for carrying on the usual activities of schools.

First, it is assumed that people in the system will be somewhat fearful of moving into untested territory. Therefore, the communication component of the support system has significant elements of what might be called "humane consideration" and is systematically screened for potentially threatening messages, explicit or implicit.

Second, it is assumed that the users of a new means of instruction will need a large amount of information about the new program before a commitment to it can be made. Therefore, the communication component will attend first and foremost to providing an extensive knowledge base that explains the many facets of the program.

Third, it is assumed that human beings learn as a consequence of a variety of information stimuli. Therefore, the communication component

provides opportunities for messages about the telecommunications program to be transmitted by print, through human interactions, as a consequence of planned hands-on experience, and so on.

Fourth, it is assumed that professional educators have reasoned concerns and valid questions about any requests made for their professional practice. Therefore, the communication component promotes two way interaction whereby potential users of the innovation can question and probe as well as receive and respond.

Fifth, it is assumed that teachers and other educators move through stages of concern about using an innovation. Therefore, the communication component of the support system shifts its emphasis as the demand for different kinds of information become necessary to support the innovative enterprise.

Sixth, it is assumed that there will be idiosyncratic needs among a number of users. Therefore, the communication system will be flexible so that these needs can be accommodated while the larger and more cohesive group of users can also be served.

The communication component of the support system, in sum, is a central one in that there is, in educational change, the persistent need for information, response mechanisms, and problem solving technologies.

To recap briefly the idea and operation of a support system, this section of the report described again the different levels of decision making within a school system. It suggested that major change in schools and classrooms, (i.e., the institutionalization of telecommunications), requires more than the efforts of teachers. It reverses the usual conceptualization of Goodlad's levels, and places the instructional level at the top with professional and policy assistance organized and delivered directly, consistently, and

coherently to teachers by the institutional and societal levels. It named five areas of need around which such technical assistance should be organized: intellectual; management of the environment; provision, allocation, and use of resources; evaluation; and communication. This reversed framework was called a support system for schools and teachers.

Telecommunications people are seen either as producers of instructional material and/or as experts in the utilization and evaluation of telecommunication products. In either role they fit into the institutional level of decision making according to this conceptualization.

Moving a support system of this kind into operation in the real world of schools and school systems, however, will require more than technical assistance for teachers at the institutional level of decision making. Each level of operation needs a "curriculum" of its own organized around the five substantive areas which appear as responsibilities at each level. And at each level of decision making the intensity of achievement differs. Some areas and levels require a literacy level of achievement. Others require performance competency.

The use of the Goodlad framework helped to organize and target the variety of technical assistance needed by teachers. The framework can, we believe, bring more internal school system order, direction, and cohesion to the everyday work of school people whose tasks are located at the institutional and societal level of decision making. It has the potential for becoming a management tool for technical assistance in instruction and as such increase the power and effectiveness of all levels of decision making within school systems.

III. Guidelines for the Design, Production, Development, and Use of a Telecommunications Program in Schools

This report has presented a large amount of technical and professional information regarding the doing of telecommunications in schools, principally from the point of view of the schools. It is acknowledged that this sharing of professional information is not an easy task for the writer or the reader but we believe it is critically important if two groups of professionals, telecommunications experts and schooling experts, are to come together in common cause. That cause, of course, being the introduction and maintenance of telecommunications programs as central instructional components of ongoing school activity.

Too often, a report of this kind ends with a list of "shoulds" or "oughts." That is, after the presentation of difficult technical and conceptual information, the reader is admonished to engage in narrowly prescribed behavior. This report differs from that pattern in that the operational information appears throughout the report in the form of examples and definitions. One intent of the report is to make the important point that change in schools, in this case the introduction of telecommunications programs, is most often situation-specific. The situation is composed of the setting variables, people and ideas and objects, as well as the curriculum under consideration. In the same way that the characteristics of a suburban, middle-class school setting differs from a rural, poverty-ridden one, the character and dimensions of a geometry curriculum differs from a social science curriculum.

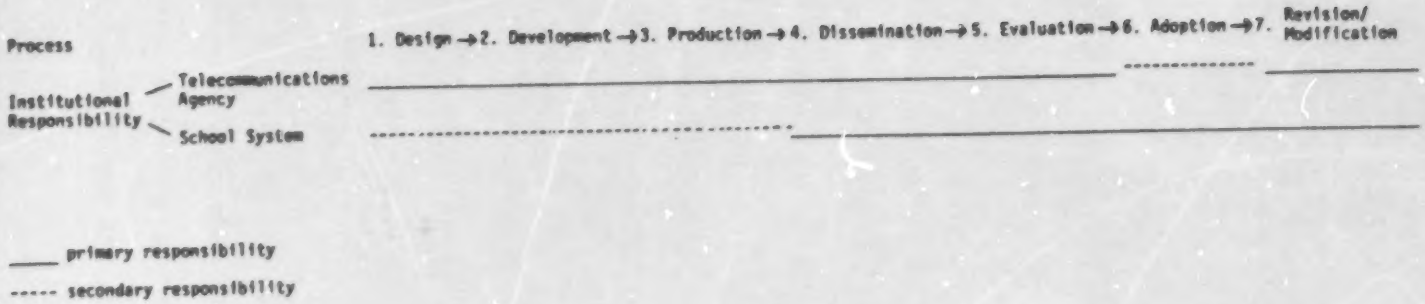
Given the acknowledgement of the differences among settings and among curriculums, it is not appropriate to prescribe a list of specific "dos" and "don'ts" as guidelines. What is appropriate is to set forth rational ways to use the information that formed the body of this report. By doing this, we

believe that the persons responsible for the doing of telecommunications and the doing of schooling can apply the principles of, say curriculum planning or staff development, in ways that are most appropriate for the curriculum area being addressed and the school populations that are conceived of as audiences for the telecommunications program.

Consequently, the guidelines that follow refer the reader to the substantive and professional materials that have preceded them. Further, the guidelines are advanced according to stages in the difficult process that begins with an idea for a telecommunications program in and by schools. Perhaps too simply, we have conceptualized the progress of a telecommunications idea to a program-in-use as having seven stages: design, development, production, dissemination, evaluation, adoption, and revision/modification.

These stages or sets of related events, again perhaps too artificial but suitable to our purposes, help to demonstrate the involvement of people in the process in terms of affiliation with telecommunications agencies or school systems. Naturally, as the complicated business of production and use occur in real life, there will be modification, adaptation, and refinement of this preliminary scheme.

The stages of the process and the institutional responsibilities are illustrated in Figure 4. The bold lines indicate major responsibility for a segment of the process, this major responsibility sometimes shared, and the dotted lines indicate a secondary, but important, set of responsibilities. The figure points out in graphic form the interdependence of the work of telecommunications experts and school persons if changes of instructional delivery in schools are to come about. Further, the figure points out the familiar dictum that "change is a process, not an event." This process


Process
1. Design → 2. Development → 3. Production → 4. Dissemination → 5. Evaluation → 6. Adoption → 7. Revision/ Modification
Institutional Responsibility
Telecommunications Agency
School System

_____ primary responsibility

----- secondary responsibility

Figure 4. Stages of the process and institutional responsibilities for developing and implementing telecommunications programs.

BEST COPY AVAILABLE

design, we think, can serve as a professional and technical roadmap for those persons engaged in design, production, and use of telecommunications in schools.

The dimensions of the process and the institutional responsibilities displayed in Figure 4 reveal a greater than usual emphasis placed upon telecommunications agencies than has been observed in practice. The findings of the DFE study reported in Volume I strongly suggest the need for this greater participation in the process and the more conscious decision to consider institutional interaction than are the usual case. The model presented here demands that institutional and professional collegiality be developed and maintained as a central function of introducing telecommunications programs into school settings. This, we know, flies in the face of the conventions of historical and current practice but evidence from a variety of sources can be used to support its inclusion in the model.

Each stage of the process included in Figure 4 has bases in the materials that have composed this report. Each will be discussed in turn, with particular attention given to the substantive and technical information that is central to the successful enactment of the stage.

Design. The design phase of a telecommunications product is necessarily concerned with setting the foundation conceptually and realistically upon which the product will be built. Major responsibility for the creation of a design obviously rests with the telecommunication agency, though first hand knowledge of and liaison with schools and school systems on the part of the designers are vitally important to the quality and eventual use of the product built on the design.

The most immediate professional tool which comes to mind as a support to a designer of telecommunications products is Ralph Tyler's rationale for

curriculum planning. The designer may first wish to refer back to definitions of curriculum and instruction on earlier pages of this guidebook as well as to a descriptive outline of Tyler's principles. Greater depth study from Tyler's little volume called Basic Principles of Curriculum and Instruction is recommended. Knowledge of this classic is important as a base for adaptation and modification in the light of newer approaches now being promoted at some universities and educational laboratories.

Note that Tyler specifies the need for two elements, a behavioral element and a content element (sometimes called process and substantive elements), as groundwork for the formation of curriculum objectives, aims, or goals. He lists several background sources for the creation of these behavioral and content elements, namely, studies of the learners themselves, of contemporary life outside the school, of subject specialists, of philosophy, and of psychologies of learning. Designers thus should have ready access to expertise in a variety of scholarly disciplines as well as to the real world of schools and young people. Such contacts are essential for the professional designer whose capacity to build curriculum objectives should be at a high performance level of competence.

Also of use to the designer are Tyler's suggestions for the selection of learning activities to accomplish the objectives, the organization of these learning opportunities or activities to produce lasting learning by the student, and evaluation procedures. Designers particularly need to know about the organization or sequencing of objectives in order that specific learnings may be reinforced again and again, and so that the learner may proceed from the known to the unknown, and from the simple to the complex.

Knowledge about the target audience for the telecommunications product is also essential for the designer. This information comes not only from

students of developmental psychology and sociology but from contact with children, young people, and schools. Contact with schools and with teachers give the designer a glimpse of the realities of school and classroom settings -- for example, the complexities of classroom management, the demands of schedules, the rhythms and regularities of the school world, the isolation of teachers from other adults, and the differences between local school "cultures." The involvement of selected teachers and principals as consultants during the design and development processes of telecommunications production is becoming usual practice among telecommunications agencies -- a practice which seems to pay off in the long run.

The decision making layers of school systems conceptualized and described by Goodlad add still another resource to be examined by designers. This report stresses the fact that both telecommunication and school people have tended to focus attention only on the responsibility of teachers for the quality of the instructional program. Goodlad's layers of decision making pull neglected areas of school systems into perspective. Understanding of these levels can broaden a designer's insight into the internal dynamics of systems. They can expose not only weak spots in the system but also their potential for strength, if educated and coordinated.

To return to the hypothetical geometry course as an illustration, awareness of the existence and importance of the institutional and societal levels of decision making in addition to the more traditional instructional level can cause designers to consider the design and production of staff development and/or informational components for all three levels to accompany a telecommunications program for schools. Or, as indicated earlier, the designers may wish to help produce a home/school product either to stand alone

outside of a school or school system, or to accompany and enhance the more standard curriculum focussed on the high school.

To sum up, at the design stage of the ongoing work of creating a telecommunications product, the major agency responsibility for initial choice and curriculum design of the enterprise lies with the telecommunications agency. Knowledge of the school world and consultation with potential users are important parts of the project and probably vital to an eventual acceptance of the product.

The Tyler/Goodlad rationale and continued liaison with the school world suggests that designers (1) select programs which meet curriculum needs; (2) have access to expertise in subject matter, human development and learning theory, and research in classroom instruction; (3) build objectives which specify content, including concepts as well as facts, and behavior, including processes and performance; (4) refer to a wide range of resource material; (5) attend to matters relating to scope and sequence; (6) substantively attend to all levels of decision making; (7) integrate into the design knowledge and understanding of the interest level and maturity of audiences, of contemporary life outside the school, of scholarly work in the structure of knowledge to be acquired, and of knowledge and understanding of relevant value systems, educational psychology, and philosophy.

Development. Development follows hard on the heels of design and often in practice is integrated with design. Like design, this phase is primarily the responsibility of the telecommunications agency. Further, the same professional tools could be of use to the developer as to the designer: knowledge of the Tyler/Goodlad rationale and the latest research about the internal "culture" of classrooms, schools, and school systems.

Within these areas of study and sources of professional information are sections of particular relevance to the developer. Since the developer is responsible for putting meat on the bones of design, the choice of learning opportunities, or events, or organizing centers are his or hers. Developers are concerned with imaginative and creative approaches to treatment and presentation. They look for illustrative topics or stories which have a classic quality. They hope these organizing centers or incidents are not quickly out-dated and have intrinsic merit in and of themselves. Note that there are numerous possibilities which can serve as vehicles to carry basic design intentions. Some vehicles are much better than others; more accurate and generic in substance and more appealing to target audiences.

Out of the range of choices for "organizing centers" which exist, some will have greater appeal for a given age range or level of maturity, and for different geographic or socio-economic areas. Some possibilities may suit teachers and principals better than others. Some may have a bitter "fit" with standard curriculums. Some may more easily gain the approval and acceptance of communities and local sanctioning bodies. Others will be more suited to the special strengths and weaknesses of telecommunication as an educational instrument.

Developers must give special attention to internal motivating and evaluative devices within individual programs. They must test and retest the field, trying to find out if students are able to perform as specified in the curriculum objectives, and where the holes are in the program and in the process of getting it accepted and used in the classroom.

Liaison with the field, the real world of students, teachers, classrooms, principals, supervisors, superintendents, boards of education and communities is even more important for the developers than for the designers. They need

to know about school requirements to follow a standard curriculum and to provide equal instructional opportunities for all students. And they need to appreciate the problem of dealing with a wide range of individual differences in ability, talent, and interest.

Research about the local school as a primary organic unit in the delivery of quality instruction can be most helpful to telecommunications developers. So is the knowledge that the principal is a key agent in successful school improvement. Developers will also wish to look for a match between potential testing sites and the target audience for the telecommunications programs.

The nature of effective teaching is a primary concern of developers. They need command of these processes not only as their developing programs attempt to help students learn the objectives set forth in the curriculum design. This command of the territory is also vital because good telecommunications programs demonstrate in action the types of teacher and student activity which promote learning, and become examples of effective organization of the learning environment, of use of instructional material, and of effective feedback. Telecommunication programs thus become potential models for teacher and student behavior and as such can serve as important tools for staff development.

Such models may well be accompanied by staff development programs either in print or via telecommunications or both. They can invite teachers (and principals and supervisors) to examine classroom management of activities relating to telecommunications, both mechanically and educationally. They, for example, can point up the importance of teacher acceptance of responsibility for all students or demonstrate the use of active teaching, pupil-teacher goal setting, frequent feedback with respect to accuracy,

careful and systematic monitoring, or such features of good teaching as well organized discussion or the nature of well designed questions.

Contacts with schools as test sites, if cooperatively planned and acted upon can also help teachers, principals, and schools learn to observe the process of putting a program in use, and how to gather systematic evidence about the effects of a program. If all this learning on the part of school people and vice-versa is to be part of the cooperative efforts of school and telecommunications people, then the establishment of pilot interactive feedback systems between the schools and the telecommunication agency is an essential feature of the development phase.

In summary, developers can, we believe, (1) make use of the Tyler/Goodlad rationale and research on the nature of effective teaching and staff development; (2) pay particular attention to the quality of the illustrative units or stories or incidents selected to flesh out the curriculum design; (3) apply knowledge of the variety of contexts in which schools and school systems exist (socio-economic mix, local political pressures, institutional traditions, etc.) and tailor their developing offerings and related resources accordingly; (4) consider the nature and meaning of "school culture" and try to negotiate a compromise between demands on teachers, in-school priorities, and the development and try-outs of the product; (5) serve as models of teaching and evaluation and as such make a contribution to staff development efforts; and (6) consider the implications of the levels of decision making within school systems and make provision for involvement of all of them in relation to product development.

Production. Production logically follows development as a phase in the overall work. Indeed, design, development, and production are operationally intertwined. For, as design and development achievements become

telecommunications programs, the strengths and weaknesses of the first two phases become apparent and particular sections are flagged for a return to the drawing board. Thus producers work hand-in-glove with both designers and developers, each depending on considerable two-way feedback between the three stages of creative activity. It would probably help producers to understand at a literacy level the same professional know-how as the designers and developers have acquired so communication among the three stages can be enhanced. On the other hand, the producers' speciality is operational and artistic knowledge and skill in technology, plus the professional knowledge and skill of a drama and performing arts director. These are areas of expertise which this document does not presume to address.

In view of the burgeoning of computer technology at this time, it is important that designers, developers, and producers be well versed in this technology, in its capacities to aid instruction, and in its interface with more standard audio-visual products like videotapes and audio broadcasts. Leaders in all three stages of telecommunication development certainly also need command of research, completed and underway, into the effects of telecommunications (including computers) upon learning environments and upon students, teachers, and others who work in the schools or learning centers.

To briefly summarize, much of the quality of the work of a producer has to do with technical and dramatic capabilities beyond the experience of the writers of this report. Production work will, however, be enhanced by a literacy knowledge of curriculum design and development, of levels of decision making within school systems, of research dealing with the teaching/learning process and staff development, and of the nature and importance of a support system for all levels of decision making.

Dissemination. To this point in the process, the primary responsibility for getting the work done has rested in the hands of the telecommunications experts. It is at this point that there is a shared set of duties. Although school persons have been consulted with and have provided advice to the telecommunications experts about design, development, and production, they have not had primary work roles, demonstrating their own set of technical, analytic, and intellectual skills.

Dissemination is the process by which an educational product or tool is distributed to potential users. It is a time of providing support, garnering responses, "hovering" over the program. In other words, it is a time of hard work, largely using interpersonal rather than technical skills, aimed at developing widespread use of the innovation. It is our conviction that this critical stage must be attended to by both telecommunications experts and school officials.

Three of the sections of this report provide substantive and strategic suggestions for going about the activities of dissemination. An analysis of the school settings into which the telecommunications program is being introduced, using the Goodlad scheme, will help to raise significant questions, note "pressure points," identify potential problems, characterize the requirements of relating the program to the users and the users' schools and classrooms. This information will lead to the formulation of a support system that is appropriate to the setting. The disseminators or "change agents" will be able to put together a plan for action that focusses on the components of the support system at the various levels of the system.

For example, in a school system where the teacher group is characterized by a commitment to text-bound instruction, the support system's contribution to dissemination could be the identification of intellectual and professional

resources designed to be used as stimuli to reorder teachers' thinking about what can be used as instructional material. The focus on the communication component of the support system might cause the change agent to consider systematic and regular information-giving sessions tied to the characteristics and value of the telecommunications system under consideration. The evaluation component of the support system would alert the change agents to the need for system-wide preparation for gathering evaluation data. And so forth. The point here is that the dissemination will be eased and made more productive if (a) the characteristics of the setting are understood at all levels and (b) the components of the support system are put in place according to the ways those characteristics are manifested in the particular school setting with the understanding that settings will differ and that the differences should be acknowledged in the dissemination activities. The days of the one-shot workshop introducing teachers and others to a new instructional program are over in terms of effective distribution and use of the program (if, in fact, they were ever effective).

The dissemination stage is also characterized by heavy reliance upon the features of the staff development program advanced in this report. As teachers and others come to decide to use (or decide not to use) the telecommunications programs, it will be necessary to make important decisions about how to help these persons introduce the programs into already-crowded instructional schedules. Attention to adaptation of program and classroom regularities is part of doing the work of staff development. Likewise, knowledge about teachers' stages of concern, whether for self-or task or impact, will help guide the staff developers' work. Who to include in staff development opportunities is a question that will have to be answered.

Providing technical and personal support is a central concern during dissemination of an educational product.

Who are the change agents, the disseminators? Obviously, school persons are important actors in this stage of the process. In fact, the traditional mode of introducing change into schools has featured the school officers as first and foremost, if not sole, inhabitants of the role. Until recent years, this has seemed to be appropriate and necessary. Research into school change over the past decade, however, leads us to advance the notion that the persons responsible for the design, development, and production of the change (telecommunications programs) join hands with the school people during the dissemination to ensure that technical and intellectual issues regarding the program can be responded to efficiently and, importantly, in relation to the school settings where those issues arise. In other words, although the designers, developers, and producers of the telecommunications program have put their best ideas and skills into the production of the program, those ideas and skills may need to be interpreted (even reconsidered) as the program faces the scrutiny of administrators, teachers, and students in schools. It should be recalled that the staff development features included the concept of mutual adaptation. The application of this concept leads thoughtful change agents to the conclusion that although the innovation is designed specifically to alter the system (i.e., instruction), the innovation will more than likely be adapted <u>by</u> the system. The partnership of school and telecommunications specialists in the process of dissemination will help to ensure that this mutual adaptation, expected and valued, will not do marked injustice to either the telecommunications program <u>or</u> to the instructional setting where it is placed.

In sum, the dissemination phase is characterized by (1) understanding of the nature of the school setting, (2) formulation and implementation of a support system using the components of that system as guides to action, (3) an infusion of staff development opportunities rooted in the understanding of the telecommunications program's features and the requirements of schools, and (4) coordinated efforts between and among telecommunications experts and school officials.

Evaluation. Obviously, throughout the process described here, periodic evaluation, probably relatively informal in nature, will be engaged in. The distinction between that evaluation and the stage suggested here is that this is a formal, systematic, and sustained effort to gather valid and reliable information about the effects of the telecommunications program upon the various levels of the system. The emphasis is upon the effects of the program in terms of its intentions and the expectations for its use, not solely upon student outcomes. This difference is important in that this phase may include a strong consideration of such issues as students' cognitive gain, for example, but will not be restricted to them. We are recommending program evaluation.

Program evaluation takes into account the desirability of gathering information about the instructional effort so that decisions can be made about effects. Clearly, effects are possible at many levels of the school system. Effects upon student behavior have already been mentioned. In addition, program evaluation would ask what effects can be found in teachers, what consequences of use can be observed at administrative levels of the system, what the cost-effectiveness of using the program is, and so on. In other words, this phase of the process again examines the system and examines the impact of the telecommunications program upon the elements of the system.

Although emphasis here is on the system, already noted, it is important to acknowledge that certain evaluation practices of past years regarding evaluation of program effects on student behavior are no longer feasible, if ever they were. In the case of ITV, for example, evaluation information was very often cast in terms of the numbers of students who had encountered a certain program. Although this is interesting to the ITV producer in terms of marketing and distribution effects, it does not give interested school persons the necessary data upon which to make decisions about selection from alternative instructional formats.

Recent years have demonstrated an increased sensitivity by school officials for so-called "hard" evidence, information that comes close to proof that instruction results in learning. Numbers of users do not tell the story of effects of use. In like vein, whether or not students and teachers like or appreciate an instructional strategy is important and valuable but only when such appreciation and value are linked to some sort of achievement gain.

The Tyler suggestions for curriculum planning and the conceptual framework detailing the levels of decision and action in the system are of particular importance for doing the work of evaluation. In the case of the curriculum planning model, attending to its four components (purposes, learning experiences, organization, and evaluation) will focus the work of evaluation on the relative impact of the curriculum on students' achievement and the internal coherence of the elements within the curriculum. By examining the power of learning opportunities to accomplish purposes, for example, the evaluator will be able to suggest adaptations in use of the telecommunications program. Likewise, student outcomes as measured by the evaluation component of the curriculum presented in the program will suggest

to teachers and others where instructional emphases need to be strengthened or where "reteaching" should occur.

Attention to the conceptual framework will focus the evaluator's energy on the need to look throughout the system for effects, not just at students but also at teachers, administrators, central office support staff, and so on. This broad scale look at evaluation will, we think, help us to avoid many of the pitfalls of the curriculum reform movement of the 1960s when new ideas and practices foundered as a consequence of inadequate institutional effort directed at promoting the work of teaching and learning. A comprehensive evaluation of a telecommunications effort in today's school will neglect the support of that effort at its peril. The success of a school innovation is not simply a testimony to teachers' work, it is a testimony to the efforts expended by the system to help the teachers' work make differences in the lives of students.

As with the dissemination phase of this process, evaluation is conceived of as being a jointly shared set of responsibilities, shared between school officials and telecommunications specialists. The model proposed here assumes that the telecommunications specialists are concerned about the effects of their work on students and dismisses the cynical point of view that once the program is sold the telecommunications agency has lost interest in the product. It is our contention that evaluation of the product will assist both telecommunications persons and school persons in making critical decisions about both production and use. The evaluation data are used by telecommunications people to provide guidelines for future work and the evaluation data are used by school people to make decisions about adoption and subsequent use of the telecommunications product. Although the uses of the data are different, according to the purposes of the institutions, the

determination of data to be collected and the jobs of collecting analyzing, and interpreting them are suggested to be collaborative. This collaboration has the potential for sensitizing all parties to the prospects and problems associated with the telecommunications program as well as to the formation of mutual interest groups. It also promises to lead to a more comprehensive and cost effective process of evaluation.

To summarize, the process of evaluation, as used in this scheme (1) focusses on program (as opposed to only student) evaluation, (2) uses the Tyler curriculum planning framework as one important guide for practice, (3) examines all levels of the system for impact by the telecommunications program, (4) is a collaborative activity between telecommunications experts and school officers, and (5) generates information for decision making about both production and use of telecommunications programs.

Adoption. The adoption phase of this process rests primarily in the hands of the school officers. It is they who decide whether or not the design, development, and production have been adequate to the curriculum task, whether the dissemination activities have been persuasive enough to capture an economically reasonable number of users, and whether the evaluation data suggest that widespread or continued use of the telecommunications program is warranted.

The decision to adopt the program for a school system, a consortium of systems, or even a segment of a system will force the school official to once again examine the support system in place in the school system to determine whether or not modifications are necessary to ensure successful adoption of the program. As with the dissemination activities, the change agent will once again turn to the components of support to speculate on the adequacy of their status to support adoption activities. Also, the school change agent will

re-analyze the evaluation information, this time to infer needed alterations in the program or in the system. It may be that some minor rearrangement of the sequence of instructional components would seem to be a more powerful way to accomplish a curricular purpose. It may be that school scheduling regularities need to be modified to accommodate program requirements. In other words, during the adoption phase, the school officials engage in a reappraisal of both the telecommunications program and the system into which it is to be introduced. This reappraisal gives direction to adoption activities.

We have suggested that the school officers are largely in control of adoption. But, as with the user input suggested for essentially telecommunications experts during design, development, and production, we believe it essential that telecommunications agency persons be aware of and sensitive to the work of adoption. In the event of a smooth and efficient adoption process, the telecommunications experts learn of positive attributes of programs and practices whereas in the event of a difficult adoption process, they receive advance warning of what to avoid the next time around.

The adoption phase of the model is (1) based on decisions made by school persons, (2) tied to the results of dissemination and evaluation activities, (3) planned in terms of needed and available support, and (4) attended to by telecommunications experts so that issues raised can be used as data for subsequent production efforts.

Revision-Modification. It is assumed by some that once a curriculum package, such as a telecommunications program, is introduced into and adopted by schools that the process of innovation or change is over. Although schools have come to be known as static and unchanging institutions, we do not believe that this is or should necessarily be the case. Human activity is an ever

changing set of events and ideas in interaction. Schools should reflect that interaction and those changes. Therefore, we believe that a significant effort in dealing with curricular and instructional issues centers around the revision-modification phase of this model.

As society changes and as the needs, expectations, and expressed values of members of society change, schools and the programs in them should change. In the case of intact programs, or, to use the term above, programs that have been adopted by schools, it will more than likely become necessary to revise or modify them so that they better fit the times and the people and ideas in them. Modifications might be needed on the basis of changing popular values, of advances in knowledge, of shifting student populations, or developments in telecommunications technology. Whatever the reasons, and there are many others that could be cited, school programs must accommodate them.

Of course, we are not proposing that every new wind should produce a marked change in how schools go about providing instruction. What we do mean is that school people and telecommunications experts should systematically and carefully engage in ongoing monitoring and reflection regarding the ways in which instructional programs do or do not get important learning tasks accomplished. When there is a discrepancy between what is desired and what is accomplished, it is time for the revision-modification phase of the proposed model to come into play. This is not uncommon in the text production field, it is less common in instructional television. We are not yet sure how common it may be in other telecommunications fields although the constantly shifting potentials of software for computers, for example, suggest that it may be more common in the future than we had ever expected.

The revision-modification phase, to summarize, acknowledges the need to (1) systematically collect effectiveness information about a

telecommunications program, (2) use that information to make decisions about future directions, (3) match future directions with the analysis of the relation between expectations and outcomes, and (4) engage the telecommunications experts in the process so that they can become partners in learning about what schools accomplish through telecommunications and how that accomplishment comes about.

Building Linkage between Telecommunications and the Schools

We acknowledge here that neither the writing nor, we suspect, the reading of this report has been easy. Completing the puzzle and fitting the pieces together in real situations are even more difficult. Yet, most of the pieces can be seen alive and working at different locations around the nation. Pulling them together at a single site could, we believe, be an exciting and a model enterprise. It could be stimulating not only because it would require professional collaboration between the two agencies in ways not yet fully explored, but also because this type of cooperative endeavor can generate unexpected power. It can, if tended and supported, produce the critical mass necessary to introduce and maintain telecommunications as a central component in ongoing school activity.

It would be even more interesting and challenging to select two sites for such an action research project. Action research is that type of inquiry often done in natural settings, sometimes by the principal actors themselves, at other times with the help of outside agencies. Natural sites are examined from an anthropological point of view with the requirement that considerable ethnographic kinds of data be collected from observations of the phenomenon. Two sites would permit the selection of one where several parts of the complex whole were already in place. The task in this instance would be to add the missing pieces necessary to make up the conglomerate and to observe what

happens. The second site would, we hope, be one with little or no experience with telecommunications. Thus it would be necessary to teach the basics of understanding and skill to all levels of the school system at the second site. The researchers would then have an opportunity to compare and contrast staff development programs and other support systems in action and to gain insight into two different types of intervention.

These paragraphs comprise but a small outline and introduction to the task -- only a cloud as big as a hand on the horizon. We do, however, visualize the possibility of building a powerful support system and curriculum for the two potential sites, as well as the mapping out of detail for such a collaborative venture.

We have already mentioned the difficulties inherent in the mounting of such a proposition. But the rewards are also great. We believe that telecommunications properly used could become the means whereby the schools and the educational establishment renew themselves.

Perhaps the construction of an incubator designed to hatch collaborative school/telecommunications sites is in order. The October 23, 1983 Washington Post contained a story entitled, "Incubator Plan Helps Firms Hatch," and which began with these words:

> Down the hall from the corporate headquarters of Power Kinetics Inc., a major manufacturer of Mirror Images Software Inc. assemble that company's computer games and sophisticated business management products.
>
> One flight down, Applied Robotics Inc. is working on a major automated factory installation for General Electric Corp. And on the lower level, scientists for Intermagnetics General Corp. are developing a magnetic imaging device that someday could replace X-rays as a diagnostic tool.
>
> This beehive of high-technological activity is no prefab modern office building, however. It's an ivy-covered brick building on the edge of Renssalaer Polytechnic Institute (RPI) campus known as building J.
>
> The old building houses these four companies and nine others in a unique "incubator" program that gives start-up companies cheap office space, access to university resources such as faculty members and computer time,

and management and finance guidance. RPI has no direct financial interest in the firm, unless a struggling company trades equity for a rent payment or two.

There's no time limit on the time that a company can spend in this incubator, but RPI officials hope ultimately to keep it to about two years.

The university administration believes that the hothouse environment of Building J has many advantages beyond giving fledgling companies a better than average chance for a successful start. RPI believes the incubator companies serve as business laboratories for RPI students trained more as engineers than as entrepeneurs. . . .

It would be a fascinating task to design and operate an incubator for effective school-telecommunications centers for learning. If business and engineering can design and build such laboratories for themselves, why not schools and telecommunications agencies?

REFERENCES

Barth, R. Open education and the American school. New York: Agathon, 1972.

Bentzen, M. Changing schools: the magic feather principle. New York: McGraw-Hill, 1974

Berliner, D. & Koehler, V. Introduction. The Elementary School Journal, Chicago: University of Chicago Press, 1983, 83(4), 261-263.

Berman, P. & McLaughlin, M. Federal programs supporting educational change. Vol. 4. Santa Monica, Calif.: Rand, 1975.

Designs for Education. Telecommunications and the schools. Concord, MA: Designs for Education, 1983.

Goodlad, J. & Klein, F. Looking behind the classroom door. Worthington, OH: Charles A. Jones, 1974.

Goodlad, J. & Richter, M. The development of a conceptual system for dealing with the problems of curriculum and instruction. Los Angeles: I/D/E/A and the University of California, Los Angeles, 1966.

Griffin, G. Levels of curricular decision making. In J. I. Goodlad & Associates, Curriculum inquiry. New York: McGraw-Hill & Co., 1979.

Griffin, G. Implications of research for staff development programs. Elementary School Journal. Chicago: University of Chicago Press, 1983, 83(4), 414-427.

Griffin, G. & Lieberman, A. Behavior of innovative personnel. ERIC Clearinghouse on Teacher Education, 1974.

Gross, N.; Giaquinta, J.; & Bernstein, M. Implementing organizational innovations. New York: Basic, 1971.

Hall, G. & Loucks, S. Program definition and adaptation. Journal of Research and development in education, 1981, 14(2), 46-58.

Joyce, B. & Showers, B. Transfer of training: the contribution of coaching. Journal of Education, 1981, 163(2), 163-172.

Kliebard, H. The Tyler rationale. School Review, 1970, 7(2).

Little, J. School success and staff development: the role of staff development in urban desegregated schools. Boulder, Colo: Center for Action Research, 1981.

Merton, R.; Broom, L.; & Cottrell, L. Sociology today. New York: Basic, 1959.

Sarason, S. The culture of the school and the problem of change. New York: Allyn and Bacon, 1971.

Tikunoff, W.; Ward, B.; & Griffin, G. Interactive research and development as a form of professional growth. In Howey, K. & Bents, R., School-focused inservice: descriptions and discussions. Reston, VA: The Association of Teacher Educators, 1981.

Tyler, R. Basic principles of curriculum and instruction. Chicago: University of Chicago Press, 1950.

Washington Post. Incubator plan helps firm hatch. October 23, 1983.

1111 16th Street NW
Washington DC 20036
(202) 293-6160